DIALOGWEB.
Guided Search | new search | favorites | settings | cost | logoff | help

❀ Dynamic Search: Computers, Electronics, and Telecommunications

▤ Records for: *toolbar*

save as alert... | save strategy only...

Output ⓘ | Format: Full Record ▼ Destination: Browser ▼ | display/send
Modify ⓘ | refine search | back to picklist

select
all none | Records **6** of **154** In full Format

☐ 6. **3/9/6 (Item 6 from file: 275)**
02283939 **Supplier Number:** 54285215 **(This Is The FULL TEXT)**
Acrobat 4: Adobe's Bid to Make It More Than Just a Viewer.(Software Review)(Evaluation)

Walter, Mark
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Text:

In mid-February Adobe introduced Acrobat 4, the first upgrade to its venerable document viewer in two years. Working with a beta release, we examined the latest feature set and found that Adobe has more than viewing on its mind. Of all the **browser** plug-ins available on the Web, few are as popular and as widespread as Adobe Acrobat. Adobe estimates that more than 50 million copies are in the field, and upwards of 2 million copies of the free Acrobat Reader are downloaded every month from Adobe's Web site. Behind the scenes, millions more copies of the full Acrobat product create the Portable Document Format (PDF) files.

But, until now, the role of Acrobat on the Web has pretty much been limited to posting the final form of documents intended to be printed. In that context, it doesn't show up much in consumer-oriented sites, but it is used extensively by businesses, both internally on intranets and externally on sites accessed by partners and customers. For several years, Adobe has recognized the potential for Acrobat in the corporate setting, placing its product marketing in the hands of a group focused on this market. But even though enterprising integrators have used Acrobat in a variety of business systems, the base product, in most instances, has not been an integral part of any business process except the publishing of final-form documents. And even in publishing, the ease of making HTML has muffled some of the product's original appeal, which was to be a universal document viewer. In this new release, Adobe is making a bid to put Acrobat at the heart of business process common to almost every organization, namely the process of reviewing documents before they are finalized. Its strategy is to make Acrobat a standard review and annotation tool not only for reviewing everyday office documents but also for Web sites, an application that to date lacks such a product.
     In addition, Adobe has added two important new dimensions to the product: digital signatures and editing. The first will be critical to integrating Acrobat with e-commerce systems; the second is a significant

step forward in convenience. Of course, there is a long list of other improvements that Adobe has made in the past two years and pulled together in this upgrade. Using a beta copy of the program, we tried out its new features, looked at the changes made under the hood to its Portable Document Format (PDF) and reviewed the product's place in the context of Adobe's overall product line. The user **interface** : from menus to palettes Acrobat 4 looks and operates much like version 3-a left-hand frame for navigation, a right-hand frame for displaying the pages, with a row of buttons across the top below the menu bar. What's new are tabs on the navigation pane, a few new menu items and a vertical strip of buttons for annotating and editing (yes, editing!) the document.

A subtle but important improvement on the navigation side is the addition of forward and backward buttons that trace your path through the document. They work just like the forward and backward buttons of your Web **browser** , adding hypertext navigation to supplement the linear flow of turning pages.

There is also a slight improvement to the main page-viewing area. You can now view spreads side by side instead of just a single page at a time.

Navigation tabs. From the beginning, Acrobat has had bookmarks and thumbnails as two methods of navigation. Bookmarks can be named and set in a hierarchy, so many people use them to create a navigable table of contents. Thumbnails are miniature pictures of each page. Both of these operate the same way in version 4 as before, except that now they are boxes that can be pulled off and placed in their own windows anywhere on the screen. Alongside the bookmarks and thumbnails are two new palettes: annotations and signatures. Both are display lists similar to bookmarks, showing all the annotations or signatures in a document sorted in several ways.

The annotation list is a feature that should have been supplied, in our humble opinion, in a 3.x upgrade. Without it, you have to step through the document looking for annotations. (Adding the list was just one of the extensions third party developers often provided in order to use Acrobat for collaborative review.) It becomes more critical in Acrobat 4, because Adobe has added so many new ways to mark up a document.

Destinations and articles. Two other list views-articles and destinations-are available as pop-up windows. Both views are slight improvements to features introduced in Acrobat 3. In version 3, Adobe introduced "threading," a feature that lets you sew together the "threads" of an article of text that spans multiple pages. Threading's important because many documents intended for print output are illegible on the screen unless they're enlarged, but, when they're enlarged, they are difficult to scroll properly for reading. With threading, Acrobat automatically scrolls an enlarged document in chunks to make it easier to read.

Also introduced in version 3 were hyperlinks that could be URLs instead of just pointers to other Acrobat documents.

What you couldn't do in version 3 was see a list of either threaded articles or hyperlinks, unless the author also created bookmarks for each article and link. In the new version, Acrobat will create lists of articles and links to external documents (including Web sites) in a pop-up window, one tab for "Destinations," the other for articles. These lists are not hierarchical, nor do they have properties, like the bookmarks and annotations. Perhaps, as a result, they have their own window and do not show up in the navigation pane. Overall, the changes are improvements, but we would have preferred to see a cohesive, single pane for viewing and modifying all links, both internal and external. Link improvements. On the subject of links, further improvements (a little overdue in our opinion) are the ability to execute actions as part of a link and to link to files not necessarily associated with a URL. The link tool now has an expanded array of options, including executing menu items, invoking Javascript, playing sounds or movies, importing data or linking to files of other applications (see photo). Of course, for links to other application files to work, the receiving party has to have an application that can read the linked document. But, by adding this function Adobe has made it much easier, for example, to include source data, such as a spreadsheet or

database file, that one might reference in a document. The ability to execute menu items is not a true macro facility, but it does extend the range of options available to the average user, and the ability to execute JavaScript adds a scripting dimension missing from previous iterations of the product. Before too long, however, Adobe will have to upgrade its link facilities to take into account the new hyperlink properties being developed by the W3C. These include branching (liks pointing to multiple destinations) and bidrectional links.

New tools Acrobat has historically been a viewing application-you take a snapshot of a document and send it to other people. In Acrobat 4, Adobe has considerably enhanced the product's markup capabilities to facilitate that reviewing process (see next section). It also has introduced several "editing" features that enable light touch-ups to finished documents. All of these are combined on a new vertical **toolbar** .

Cropping a page. Acrobat now has a cropping tool that lets you crop out part of a page. The tool operates the same as other Adobe applications-Illustator, Photoshop, PageMaker and InDesign.

Adding a movie. Adobe has been showing for more than a year how it could embed movies in an Acrobat document. Now it has made adding a movie as simple as adding an annotation. When placing movies, you have the option of displaying the first or any other frame as a static image in the document so that it looks okay for printing. You can also set whether the movie plays automatically or only when clicked on. Creating a form. A year ago Adobe released two Acrobat plug-ins that provided a forms capability within the product. One plug-in enables authors to create the forms; the other enables users to fill them in. Behind the scenes, JavaScript does the action of posting the data back to the server over the Web. In Acrobat 4, both of these plug-ins are supplied with the full Acrobat product, and the plug-ins for filling in the forms are part of the Reader and Business Basic editions.

Four years ago, this feature would have transformed the way forms are created. Today, with many businesses turning their paper-based forms into screen-friendly HTML forms, this feature is a bit of a throw-back: a convenient way to convert legacy forms to online forms for those unwilling to go to the trouble of on- screen design or who want to preserve the look of their print forms. The current Acrobat forms implementation is based on JavaScript 1.2, developed by Netscape in 1996 for version 2.0 of Navigator. Obviously, there are later versions of JavaScript, as well as other scripting methods and API's Adobe might want to use. According to Sheri Schurter, an Acrobat product manager, "like most vendors, Adobe is looking at the Document **Object** Model and other Web standards to see how they fit with our products." Because forms are implemented as plug- ins, it is conceivable Adobe might update this capability independent of its next major release.

Working with the program, we found the tools to be friendly and straightforward, but not better (certainly not in power) than what you get for HTML forms. The primary advantage of Acrobat forms remains their print fidelity-if you're like the Internal Revenue Service and you want online forms to look the same as your printed ones, Acrobat is a natural choice. If print fidelity is not important, then you're better off sticking with HTML.

Touching up text. Arguably one of the most significant changes in version 4, the new touch-up tool lets you correct typographical and styling errors directly in the PDF document, without going back to the source and regenerating the PDF all over again. Anyone who creates Acrobat documents on a regular basis will appreciate this feature. For those who want even more control, there are full- fledged PDF editing tools, such as PitStop from EnFocus.

Signatures add authenticity When viewing a document, how do you know it's authentic? In Acrobat 4 and PDF 1.3, Adobe has added support for digital signatures. Acrobat's SelfSign feature employs a self-signing, key-based signature with 1,028-bit RSA encryption that is licensed for export. The document itself is limited to 40-bit encryption, the limit allowed by current U.S. law. Third-party digital signature technologies, including biometric signatures and signatures that have been verified by

certificate authorities, may be substituted or layered on top of Acrobat's implementation through plug- ins at the API level. To date, Adobe's partners on digital signatures include Entrust, Verisign, PenOP, Coastek, Silanis Technology, Communications Intelligence Corp., Digital Applications, and Seal Systems.

This feature is critical to using PDF forms and documents for e-commerce applications. For purchase orders, receipts and the like to be valid documentation of a transaction, businesses have to be able to verify their authenticity. In many cases, creating a complete system will entail integrating several systems together. Adobe's recent reorgan- ization-which placed the Acrobat product in the hands of a marketing and sales team charged with creating **custom** PDF solutions in the corporate market-should dovetail with its product plan, which is to offer a small base set of signature features but will allow developers and integrators to extend that set through the API.

Revision tracking. Adobe also is making use of signatures to track iterations of a document. Acrobat 4 tracks changes to any signed document and lets you "roll back" a marked-up document to any previously signed version. This recording of changes could easily be tied to a revision-control or workflow-tracking system. A peer-review system, for example, could be set up to read the signatures and automatically route those from reviewers to appropriate editors and route ones with changes to a different desk than ones without changes. Unfortunately, in its crunch to get Acrobat 4 out, Adobe was unable to include the signature support in the initial Mac release of 4.0. We were assured that an update is already underway.

Expanded annotations and markup Acrobat has had annotation capabilities since version 2, but they have been limited to simple text boxes attached as notes to a page. In version 3, the opening up of the API enabled third-party developers to extend annotations. Ambia Corporation, for example, created a plug-in called Re:mark that provided a whole set of tools to proofreaders, editors and reviewers for marking up PDF documents. In version 4, Adobe has licensed the Re:mark tools and incorporated them into the main application. The improvement is substantial, even to the point where we can now recommend it for a wide variety of review-and-approval cycles in most aspects of office and formal publishing. Incidentally, by coupling the annotation features with the new Web- capture facility, Adobe has created the first inexpensive tool for reviewing and annotating Web sites.

Annotation improvements. The annotation tool now has five options-notes (same as before), text, audio, stamps and attached files. All appear on the document as icons layered on top of the underlying document.

The stamps are PDF files distilled from vector or raster art. Adobe supplies a collection of predrawn stamps, but you can easily make your own.

Files of any data type, as mentioned above under links, can now be attached. Using the annotation tool, the attachment shows up on the document as a special icon.

Text and graphic markup. In addition, you can now highlight, strike through and underline text, and associate a note with your markup if you like. The text of the note shows up in your annotation list. If you choose not to add a note, the text you've highlighted shows up. You can also annotate by drawing freehand using lines with a pencil (a graphics tablet helps!) or by drawing boxes or ovals on the page. These also can have notes associated with them.

Improved property sheet. A welcome improvement is a property sheet on annotations (see photo). The set of attributes remains limited, but it does include "author," an attribute that in previous versions had to be faked by assigning authors to different colors and could only be handled properly by a third-party plug-in, which a vendor such as Documentum developed.

Once you've collected reviewer's comments, you'll want to be able to see them individually, collectively, and selectively, sorting them by author and, possibly, by type. To see annotations individually, you can just turn the pages. To see them as a group, you can make use of the new "scan" function, which builds a list of annotations and markup into the annotation palette. The hierarchical list shown in the palette can be

sorted by type, date, author, or page (see photo). An alternative is to summarize them: Acrobat 4 will gather all annotations into a text document, sorting them by order of their appearance. Lastly, Acrobat 4's Filter Manager lets you turn annotations of different types or by different authors on or off, making it easy to see changes by a single reviewer, for example. Overall: a marked improvement. Acrobat's new annotation facilities are great for most purposes. The addition of the author attribute-a glaring oversight in version 3-in tandem with the annotation list makes Acrobat a natural choice for gathering feedback and incorporating it into the correction cycle, without the worry of sending reviewers revisable source files. The annotation features are also one of the few reasons we can see to use the Web- to-PDF capture utility included in Acrobat 4. For most people, letting people review a new Web design is as simple as posting it to a secret URL. Turning the site into PDF does involve an extra step, but it creates a static snapshot of the site that reviewers can easily annotate with Acrobat 4. What's missing. While they will satisfy many users, the base annotation features of Acrobat are still inadequate for some tech-doc and engineering applications that require keeping tracking of revisions and annotations at a very granular level. Because Acrobat annotations are tied to the x-y coordinates of the page, there's no way to tie a note to an element and merge it with the source document except by hand. Also missing is a way to bring notes forward from one revision of a document to the next.

The other limitation is that Acrobat's annotations have but four properties- color, date, icon and author. We've always felt that the product ought to provide a way for advanced users (not C programmers) to extend the properties of the annotations. Acrobat 4 does let users create new kinds of stamps, but there's no way (without accessing the API), for example, to create a property such as "priority" (with values such as must-make, suggested change, clarification and typo) and add it to the annotation properties. The upside is that it's likely that enterprising developers will continue to build on Acrobat's base functions in this area.

Capturing snapshots of Web sites A plug-in shown last fall at **Internet** World (Vol. 3, No. 3), the "capture Web" facility grabs a Web site and converts it to PDF using its own routines. It works interactively (though you can minimize the process after it starts) and pulls all the pages as many levels deep as you want. It also creates bookmarks (but not thumbnails) of all the pages and builds a list of "destinations," which are links to external sites.

As we noted in our write-up last fall, the Web-capture utility converts links to Acrobat links and uses the PDF forms feature to convert HTML forms and pop-ups.

Unfortunately, the Web-capture utility is not available in the Mac version of Acrobat 4.0. Adobe promises to include it in a point upgrade later this year.

Interactive, not batch. In terms of settings, Adobe's process is not as slick as other Web-grabbing utilities that have been around for more than a year. For example, you have to run the utility live from the desktop; you can't schedule any sort of batch, offline or periodic downloads, which would be very helpful for capturing a large site. It also does not identify broken links within the site-a feature that may not be critical but certainly would be useful to know for archiving or peer-review purposes.

Capture for review. On the plus side, once you have your PDF capture of a site, you have all the Acrobat markup and annotation tools at your disposal. Particularly for comps of new page designs, this method strikes us as very handy. You can E-mail the PDF to several people, or post the PDF instead of just the live site, and reviewers can annotate it to give the designer their feedback. If posted to a network or Web site, everyone can see each other's annotations.

There are limitations, however. Acrobat is not an HTML **browser ;** although it does support JavaScript in its forms, it doesn't emulate all of the interactivity you can create in HTML, especially for level 3, 4 or 5 browsers. As a simple example, it captures only the first frame of an animated GIF, not the whole sequence. To get a true feel for how a page

operates, you still have to view it in a **browser** . In this context, we can see using Acrobat alongside a private URL to post-site a live site and PDF snapshots that are used to gather comments.

Archive. A second reason one might want to capture a site to PDF is to create an archive snapshot of a site at a given point in time. This PDF archive would put the site into a single file that can be kept intact or annotated if desired. Bear in mind that this is not a backup from which you can restore the site-for that you would want to simply back up the Web server's disk.

Distiller: Improvements in making PDF In Acrobat 4, as before, there are four ways to make PDF:

* PDF Writer. The PDF printer driver, which runs on the Window or Mac, generates PDF when printing from a desktop application. ? The Distiller. The primary method professional publishers use to create PDF, Distiller is a utility that has configurable settings for converting PostScript files into PDF. It is much improved in Acrobat 4.

* Capture PDF. The Capture utility OCRs scanned documents and converts them to PDF. In Acrobat 4, Adobe has added a utility that captures Web sites and converts them to a single PDF document.

* Generate PDF programmatically. Because PDF is a format documented for the public, developers are free to write their own applications that create it. To date, only a few developers, such as Cascade, have utilized that capability, but it could become more popular, now that Adobe has made PDF more amenable to storing structure and attached files. New settings. Acrobat 4 acknowledges that even though Acrobat is platform- and media-neutral, you still might want to change your settings to take into account different output media (so much for create once, publish many). For example, to keep file sizes down for the Web, you might want to drop the resolution of embedded photos. Adobe has simplified the Distiller settings in a very good way. The casual user need make only one decision, choosing from screen, laser printer or offset press outputs. That choice loads in a bunch of Distiller options for fonts, compression, OPI and so on. Based on what we saw in the beta, Adobe picked fairly sensible defaults for each setting. But experts never accept the defaults. So the individual options for each setting can be edited. For example, you can change just the downsampling resolution for offset press output, leaving the resolution untouched for screen or laser-printer output (see photo).

Each of these settings lives in its own file in the Distiller/Settings folder. You can easily make a new file for special purposes. For example, each commercial printer might want to set the options for his particular equipment, then distribute his settings file to all his customers. Publishers and their design and creative service partners can create and easily share settings for Web, CD, proofing or press output, any of which may be tweaked differently. Conclusion Acrobat 4 is a useful improvement to Acrobat, one that for the most part succeeds in taking the product from viewer to "reviewer." Its PostScript origins, a tie to the past that keeps it from breaking free of the print paradigm, are still a strength, because virtually all programs these days can output PostScript for printing. Likewise, its method of attachment- markup and notes to x/y coordinates of a static snapshot of a document-may seem a throwback to red pencils and Post-It Notes, but let's face it-those are the tools the great majority of people still use to mark their comments for colleagues. By carrying forward paper into the digital era, Adobe provides a level of comfort that we expect will be very appealing to a culture already feeling overwhelmed by the swiftness of change.

On the Web, Acrobat 4 is not likely to pose a serious threat to HTML. PDF, after all, is still a static snapshot that bucks the market shift toward dynamic formatting on the client side. There are, however, times you'd like to render on the server side and keep it intact, whether to show the original format of a journal article, to condense a long reference document or to distribute mission- critical forms that you want employees or customers to be able to print. Acrobat's annotation facilities, in conjunction with the Web-capture utility, make it a practical choice for reviewing Web designs as well. In all these instances, Acrobat serves the purpose better than any competing technology. For e-commerce, Acrobat's

print fidelity, coupled with its new authentication features and API, provides an interesting base for building PDF components into an overall solution. One can still use HTML with authentication, of course, but HTML and XML, by definition, are editable files that are rendered by the client. In situations where you want an electronic document to represent authentic proof of a transaction, or where it is the document itself that needs to be authenticated, PDF has the advantage of putting the publisher in control of the document's appearance and behavior.

Lastly, though Adobe hasn't made much noise about them yet, the changes it has made under the hood to PDF are well worth your attention. After many years of paying lip-service to structure in documents, Adobe is now finding that all of its print customers are contending with Web publishing, and looking for products that are less media-specific. Typically, that means being able to reformat documents, making use of internal markup, a task that just hasn't been possible once they were in PDF. In version 1.3 Adobe has at last provided a method for incorporating structured markup into its rich imaging format, and has thereby extended PDF's lifeline well into the future. Key Changes Due With PDF 1.3 The Portable Document Format (PDF) underlying Acrobat, which has remained stable at version 1.2 since Acrobat 3 was introduced in November 1996, is being extended in several key areas in version 1.3, which will be published this spring to coincide with Acrobat 4. Here's a summary of the key changes:

Hierarchical structure. For years, publishers have asked if Adobe couldn't find a way to carry descriptive markup along with the PostScript representation of body copy inside a PDF document. Doing so would combine the best of both worlds- PostScript for layout, and SGML for document structure. At long last, they'll get their wish. In Acrobat 4, Adobe offers an API for creating a PDF dictionary containing hierarchical structures. This will enable XML-like tags (which, by definition, are hierarchical), to be embedded in the text stream of the PDF document. This information can be used in a variety of ways-to improve searches, to locate elements for manipulation or retrieval, or to carry additional information for interchange. Adobe is not making use of this facility in Acrobat 4 or the initial release of InDesign, but we wouldn't be surprised if Adobe exploited it in the very near future in its vector graphics applications (PGML/SVG are XML-based), in FrameMaker (which has an XML option) and in future releases of InDesign (which are supposed to address cross-media publishing).

External objects. In addition to storing structure inside the document, PDF makes it easy to attach files of other data types. This hasn't changed in 1.3; it just becomes easier because it's supported in the user **interface** of Acrobat. In the XML scenario, for example, you'll be able to attach the XML source document as well as embed tags within the PostScript stream. PDF is agnostic about what types of objects you're attaching-they may be spreadsheets, movies, Powerpoint presentations or files of any data type. Color profiles. PDF 1.3 adds support for ICC color profiles inside PDF documents, a key requirement to implementing color management within an all-PDF prepress and digital printing workflow. The profiles may be attached to individual pictures, and the Distiller will accept profiles passed to it in a PostScript data stream. Acrobat 4's Distiller can assign default or user-defined profiles to images without profiles. PostScript 3. The few new imaging operators introduced in Postscript 3 are supported in PDF 1.3. Most notable are blends, which now can be vector- based.

Signatures. The new digital signature feature described in our review is a new dimension to PDF, and Adobe has developed new APIs that enable developers to extend the base functionality provided by Acrobat 4.

Expand forms. In version 4 Adobe has expanded its forms API with new objects and written it as an extension of JavaScript.

Job tickets-something different. The much-anticipated print job ticket feature is not part of a Acrobat 4 or PDF 1.3. According to Adobe, the spec is being written in PDF 1.2 to make it compatible with existing equipment in the field.

Company Names: Adobe Systems Inc.--Products
Geographic Codes/Names: 1USA United States
Descriptors: Portable document software; Software single product review
Event Codes/Names: 350 Product standards, safety, & recalls
Product/Industry Names: 7372505 (Portable Document Software)
SIC Codes: 7372 Prepackaged software
NAICS Codes: 51121 Software Publishers
Ticker Symbols: ADBE
Trade Names: Adobe Acrobat 4.0 (Portable document software)--Evaluation
File Segment: CD File 275

DIALOGWEB.

Guided Search | new search | favorites | settings | cost | logoff | help

Dynamic Search: Computers, Electronics, and Telecommunications

Records for: *toolbar*

save as alert... | save strategy only...

Output ❓ | Format: Full Record ▾ | Destination: Browser ▾ | display / send

Modify ❓ | refine search | back to picklist

select
all | none   **Records 24 of 154 In full Format**

☐ 24. **3/9/24 (Item 24 from file: 275)**
02142342   **Supplier Number:** 20305247 **(This Is The** FULL TEXT)
Meeting of the minds. (10 Web-based discussion applications) (includes related articles on discussion models and the Editors' Choice) (Software Review)(Evaluation)

Alwang, Greg
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Abstract: The market for Web-based discussion software is growing rapidly. Ten of the top discussion applications are evaluated and compared. They include Expressions Interaction Suite 3.0, FirstClass Intranet Server 5.1, Message Boards 1.01, Motet Conferencing Software 1.26, Proxicom J/Forum, WebBoard 2.0, Web Crossing 2.0.2, Well Engaged Discussions 1.5, WildCat! Interactive Net Server and Xpound! HT 2.21. Seven of the products run on Windows NT, the others on Unix. Prices range from $59.95 to over $1,000, depending on the number of users supported. Four of the applications employ the linear discussion model, the others offer the more advanced threaded model. eShare Technologies' Expressions Interaction Suite received the Editors' Choice award.

Text:

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Networking

Usenet newsgroups, or special-interest groups, have been using text-based
discussions to build online communities for years. But not until the
corporate community got into the act did Web-based discussion packages
begin to gain momentum.
        Companies such as Goldmine Software and Hewlett-Packard Co. use online
forums as a cost-effective means of delivering technical and customer
support: Users log on to the discussion and type in a question, and a
support person responds in writing. And media giants The Wall Street
Journal and Columbia Tri-Star host forums on financial market and
entertainment topics, respectively, as a means to add value to their
primary offerings, promote loyalty, and build brand recognition.
        In this growing market, we uncovered dozens of discussion packages.
For this article, we review the ten leading products. (For information on
additional packages, see the sidebar "Other Discussion Packages.") Seven of
these products run on Microsoft Windows NT servers, three on Unix platforms
only. One Unix offering, Well Engaged Discussions, hosts most of its
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customers' forums, so for our tests we allowed Well Engaged Discussions to host our forum site on its servers. Five packages come with built-in Web servers, but all are flexible enough to work with a mix of servers. Prices range considerably, from $59.95 for two boards with ten conferences per board (from WebBoard) into the low thousands, depending on the number of users you need to support.

messaging models

Discussion forums display messages using either a threaded or a linear model. Linear discussions resemble a sequential conversation consisting of one continuous strings of messages, retaining the discussion flow in strict order of response. Although this displays the discussion progression over time, it doesn't allow anyone to respond to a specific message. Invariably, you'll find yourself wading though myriad postings to find the one you want. Despite these limitations, four packages use the linear model.

The threaded model is a richer, more flexible mechanism. A message can either kick off a new thread or serve as a reply to a thread already posted. You can pinpoint and respond to specific messages and responses. Navigation is much more efficient: You can expand or collapse threads, which lets you skip over tangential conversations. Viewing thread headers is a quick way to grasp the gist of the discussion.

features and functions

All in all, we found these products fairly easy to set up and administer. While each allows discussion access through a Web **browser** , the **browser** interfaces for FirstClass Intranet Server and Wildcat! Interactive Net Server provide only bare-bones capabilities. Each product offers an optional proprietary client, however, which puts them on an even footing with the others.

Built-in templates make deploying a discussion site quick business, but customization capabilities are all over the lot. With the exception of Expressions Interaction Suite (our Editors' Choice), each of the products requires some degree of HTML editing--not difficult for anyone familiar with HTML but time-consuming nonetheless. Proxicom J/Forum and Web Crossing allow for extensive customization, but you need to master proprietary scripting languages. The client/server version of FirstClass includes a customization tool that lets you alter attributes without HTML, but the tool is difficult to use. Expressions, by contrast, includes an excellent set of WYSIWYG customization tools.

All the packages except Motet Conferencing Software provide some power to moderate the discussion by permitting the moderator either to accept or reject each posting or to edit the message before entering it into the discussion. WebBoard offers outstanding archiving capability--the ability to save deleted messages--highlighted by a feature that lets you put formerly archived messages back into the discussion. Only half the products offer profanity filtering, but each provides searching, sorting, or both.

The packages allow various degrees of message control. Web Crossing lets you post only plain-text messages, while others such as Expressions, J/Forum, and WebBoard let you embed file attachments or display e-mail addresses and URLs as links. And Well Engaged Discussions includes a unique feature that lets you collapse the body of a long message into a link. More than half the products offer e-mail notification when a user responds to your posting--a nice time-saver if you can't check the forum frequently. Several products also include real-time chat rooms.

Discussion alternatives

Businesses have long used groupware discussions internally for brainstorming and collaboration, project tracking, and information distribution. All the major groupware packages now feature Web access, ostensibly transforming them into Web-based discussion servers. (See the sidebar "Prying Open Groupware.") These products also allow you to replicate discussions to read off-line, a feature you'll find only in the otherwise disappointing Wildcat! Interactive Net Server. But significantly, groupware threaded discussion lacks moderation and profanity filtering.

For those considering using a groupware package for internal threaded discussion combined with a Web-based discussion server for public discussions, there is another option: Teamware products such as HotOffice Virtual Office Service provide such collaboration features. (For more

information, see "Instant Groupware" in our February 10 issue.)
    Expressions Interaction Suite
    In a field marked by wide-ranging feature sets, implementations, and prices, Expressions Interaction Suite 3.0 (starting at $795 list) offers the fullest set of capabilities at the best price, earning our Editors' Choice. The threaded product has a strong focus on ease of use, from the wizard-based installation to an intuitive and easy-to-**customize** user **interface** . The product's slew of innovative features includes the ability to link to other eShare servers, real-time chat rooms, user-name filtering, Web tours, and read-only forums.
    Setup was painless. eShare's Midway Server connection lets you connect to other eShare servers worldwide, allowing you to access other chat rooms, search for users, and contact fellow users via a messaging utility.
    Expressions packs a full complement of additional features, including a dial-up BBS discussion board, chat rooms, and a database generator that lets you edit discussion fields without writing HTML. Web Tours, another unique feature, lets you conduct interactive Web site tours or show a slide presentation. There's also the ability to add rotating ads and banners globally or to individual discussion boards.
    Expressions' administration capability is powerful and easy to use. You can limit the length of a message and the number of replies and specify a discussion board's attributes, such as read-only or moderated. You can preview messages before posting and control which users can add attachments or HTML tags. And read-only forums serve as an effective way to make global announcements. For profanity filtering, the product has a user-definable dictionary.
    Expressions' customization features are outstanding, providing the power to make extensive changes without editing HTML. The Color Picker lets you change an **object** 's color simply by selecting the **object** and choosing from a palette. The Database Generator lets you add, edit, and remove discussion fields using simple forms.
    The user **interface** is extremely well laid out and intuitive to use. The message board area is divided into three easy-to-navigate panels. You can view or create messages easily using navigation and reply buttons, and embedding attachments and links is also easy. Expressions features rich full-text search capabilities but no message sorting.--Dawn A. Learned
    Expressions Interaction Suite 3.0. List price: 50 users, $795; 150 users, $1,695; 250 users, $2,295; 550 users, $3,495; 1,050 users, $5,995. Requires: Microsoft Windows NT, Solaris, or BDSI server; **Internet** Explorer 3.x or Netscape Navigator. eShare Technologies, Commack, NY; 888-374-2734, 516-864-4700; www.eshare.com. Choose 501 at www.pcmag.com/infolink.
    SoftArc Inc.: FirstClass Intranet Server
    Unlike most products targeted primarily at commercial Web sites, FirstClass Intranet Server 5.1 ($999 list) is a client/server package that also provides an optional Web-based **interface** . While we found the messaging capabilities of the **browser** version extremely limited, the client/server package marks a satisfactory choice for hosting corporate threaded discussions.
    The lack of a single, unified setup wizard made installing the various components confusing. The administration tools are convoluted to use, though they are granular. Numerous menus of configuration options warrant better organization, and an automated message expiration feature can only delete outdated messages, not archive them. Administrative controls are average. You can permit users to register for forums automatically, and you can configure a forum as public, private, or moderated. There is no filtering.
    Creating forums is simple. To publish a discussion on the Web, simply drag and drop the forum icon onto the **Internet** folder. Customization requires editing the HTML templates. Using the client/server version's Intranet Client gives you the power of FirstClass Designer, a sophisticated tool for fine-tuning the discussion **interface** without editing HTML. The product is geared, however, exclusively to programmers and advanced users.
    The Web-based version lacks nearly all the message-control features of

the client version. Messages are displayed in linear format in reverse chronological order. There's no way to delete, sort, or search them or to add attachments. Posting a message requires that you download a JavaScript template from SoftArc's site. (The template will be included in an upcoming release.)

The Intranet Client does boast good end-user navigation features, including full message threading, end-user posting and editing capabilities, searches across forums, and multiple sorting options.
    --Sean Gonzalez
    FirstClass Intranet Server 5.1. List price: $999. Requires: 486-based PC or better, Microsoft Windows NT Server or Workstation 3.51 or later, 8MB RAM. SoftArc Inc., Markham, Ontario, Canada; 905-415-7000, 800-763-8272; fax, 905-415-7151; www.softarc.com. Choose 502 at www.pcmag.com/infolink.
    ichat Inc: Message Boards
    Long known for real-time chat software, ichat makes a foray into discussion with Message Boards 1.01. Typically bundled with Rooms, ichat's real-time chat application, Message Boards is also available separately ($2,995 list). While the program is difficult to **customize** , outstanding administration capabilities--powerful moderation and filtering in particular--make it a good choice.
    Installation is simple, with server components installing fairly easily. Unique to ichat is the common Web Server and Communications Hub, which drives all ichat components you run (such as Rooms). Administration is stellar. You first need to designate an "admin" user, but after that a well-designed administrative menu puts all tools at your disposal. Configuration options are plentiful, and access control is granular. You can even connect to Message Boards via an NNTP client.
    Message Boards' filtering mechanism is one of the best. Setting a mask and default behavior let us activate an extensive filtering system that blocks words or replaces them with acceptable ones. The masks can even contain unlimited wildcards. Moderation features are also impressive. The discussion creator is considered the de facto moderator, though administrators have the power to override user-created moderated discussions. The package also includes real-time features and the ability to connect to ichat Rooms servers.
    Customizing the discussion site takes a good deal of work. All changes required that we edit the HTML directly from the server, a simple though time-consuming task we were unable to perform remotely.
    The end-user **interface** provides a solid feature set. However, we experienced occasional refresh anomalies that slowed the display of new posts and the removal of deleted ones. Reading and posting messages were easy, as were sorting and searching for a particular message.
    --Heath H. Herel
    Message Boards 1.01. List price: $2,995 and up. Requires: Microsoft Windows NT 4.0 or Unix, 32MB RAM, 20MB hard disk space. ichat Inc., Austin, TX; 888-242-8669, 512-425-2200; www.ichat.com. Choose 503 at www.pcmag.com/infolink.
    Bryan Higgins Software: Motet Conferencing Software
    Unix-based Motet Conferencing Software 1.26 (starting at $500 list) provides a threaded-discussion solution similar in design and feature set to NNTP news readers. The CGI user **interface** is primitive next to the Windows-based packages, and the server lacks important features such as moderating, searching, and filtering. Nonetheless, if you're shopping for a powerful Unix solution and don't insist on a user-friendly front end, you'll find Motet's administration and customization features impressive.
    Seasoned Unix administrators won't find the installation difficult. The Install file walks you through the steps necessary to configure Motet with your Web server. The entire installation connects to your server's CGI-bin, and all the system's functions run as CGI programs attached to your server.
    The administration tools are simple to use yet powerful. Installation creates the default forum and basic user **interface** . The administrator has the power to require that a new user submit a valid e-mail address upon registration, a system that can curtail spamming. There's no filtering or moderation, but Motet lets you build a "kill file" that blocks messages

from unwelcome visitors.

Customizing discussions requires considerable effort. You can adapt a configuration file to reflect changes in background color or art, and an administration utility lets you **customize** banners, headers, footers, and log-on and exit screens, but extensive changes require you to edit HTML directly.

The CGI-forms user **interface** is stark compared with those of the Windows-based products, but end-user capabilities are on a par with the competition. Motet's threaded model lacks the ability to collapse threads, making reading and posting messages more time-consuming. The program displays URLs and e-mail addresses as links; there is, however, no search capability.

Motet's shortcomings are balanced by strong user-definable sorting features that let you view messages by date, topic, and read status.--HHH

Motet Conferencing Software 1.26. List price: $500 and up. Requires: 486-based PC or better, 16MB RAM, 50MB hard disk space. Bryan Higgins Software, Berkeley, CA; 510-549-9172; www.motet.com. Choose 504 at www.pcmag.com/nfolink.

Proxicom: Proxicom J/Forum

If you value customization above all else, then look to Proxicom J/Forum 1.0 (starting at $7,500 list). J/Forum, part of the Proxicom Community Suite, provides firm yet flexible control over many aspects of site administration, as well as a robust code-based framework for customizing discussion forums. Unfortunately, this power is offset by a frustrating installation procedure; no moderation, filtering, or archiving features; and a high price.

Many of the setup headaches we suffered could have been avoided if the program had granted us access to the online manuals and installation guide during setup. It let us read them only after the fact. Configuring the server and the included SQL database was complicated, a process punctuated by the program's refusal to accept our administrator ID. We had to call Proxicom technical support to get up and running.

We found the administrative features easy to use, though lacking in filtering, archiving, and moderation capabilities. J/Forum uses Access Control Lists (ACLs), an administrative method that can serve to moderate forums, in a sense: Administrators place registered users on an ACL and assign them forum privileges such as reading, posting, and deleting. The administrator then applies that ACL to one or more forums. Setting up a forum is a snap; simply click Create Forum, enter a forum name and description, and then select an ACL to associate with the forum.

Though customization options for J/Forum's proprietary Proxicom Template Markup Language (PTML) templates are plentiful, taking full advantage of them requires a solid knowledge of HTML, Java, and CGI scripts. PTML is a J/Forum extension to HTML that lets you control some Java elements without writing code.

The J/Forum user **interface** is full-featured and easy to navigate. There's no support for file attachments, but useful features include HTML message formatting, message previewing, and the ability to display e-mail addresses and URLs as links. J/Forum's search capabilities are boosted through unique SQL capabilities. Searches may be performed on message bodies, subject, or authors, across or within forums by component, forum type, or type of message. You can also create **custom** search queries.--DAL

Proxicom J/Forum 1.0. List price: 10 forums, $7,500; additional 10 forums, $4,500. Requires: Pentium-based PC with Microsoft Windows NT 3.51 or 4.0, or Unix server with Solaris; 64MB RAM (256MB recommended), 200MB hard disk space, **Internet** Explorer 3.x or Netscape Navigator. Proxicom, Reston, VA; 888-932-4323, 703-262-3200; www.proxicom.com. Choose 505 at www.pcmag.com/infolink.

O'Reilly & Associates Inc.: WebBoard

WebBoard 2.0 (starting at $59.95 list) provides a good, quick-start discussion package priced so reasonably that you'll wonder why others cost so much. Even though WebBoard lacks a slick user **interface** and requires an experienced Web author to **customize** it, the product is very easy to administer and includes some useful features other packages lack, such as

archiving, real-time chat, and a spell-checker.

Installation took only a few minutes. The package includes a built-in server, chat rooms for live discussions, and excellent documentation and wizards for hassle-free administration. WebBoard bundles an extensive set of administrative tools, including wizards for archiving messages and adding a conference or a user. Message control is granular, letting you restrict forum membership and the implementation of active links and file attachments. Most notable is the power to retrieve archived messages and add them to a discussion under a new topic.

The package contains good moderation tools but lacks content filtering. An administrator can set a discussion as moderated, specify a moderator, and if the conference is private, list users to be granted access. The moderator can approve messages without reading them, edit and post them, or delete them.

WebBoard is fully **customizable** , but unlocking this control requires advanced skill in HTML editing and familiarity with JavaScript. WebBoard gives you access to all HTML files, so you can change anything from the design of the New User Information form to the graphics display in the **toolbar** file. The manual includes a well-referenced section on the purpose of each WebBoard HTML file.

WebBoard's user **interface** is bland, but its feature set is rich, including deep message threading, e-mail notification, support for file attachments, and a spell-checker. In addition to good searching and sorting capability, there's a unique feature that lets you locate other users by typing a user name or by pressing a letter of the alphabet in a special search form.--DAL

WebBoard 2.0. List price: 2 Virtual Boards, 10 conferences each, $59.95; WebBoard 2.0 XL with 255 Virtual Boards, unlimited conferences, $349. Requires: Microsoft Windows 95 or Windows NT 3.51 (Service Pack 3); O'Reilly & Associates Inc., Sebastopol, CA; 800-998-9938, 707-839-0515; www.oreilly.com. Choose 506 at www.pcmag.com/infolink.

Lundeen & Associates: Web Crossing

As Web-based discussion software goes, Lundeen & Associates' Web Crossing 2.0.2 (starting at $995 list) presents a fair mix of features and functions. Administrators will love the granular control over configuration and customization, but users will find the linear discussion model hard to use and less flexible than any threaded package.

The setup wizard makes installation easy. The configuration utility makes it easy to turn Web Crossing on or off and provides a quick way to monitor the server status. Administration is simple. Discussions are organized within folders and displayed as icons, and folders can be nested. We found it easy to set restrictions within a given folder, prohibit the creation of additional folders, or restrict a folder to accept only discussions and not nested folders. The administrator can implement user-level security, which lets users add, edit, or delete messages based on their status.

There is no moderation or filtering, but a unique feature that places new users under provisional status gives you control over the discussion. Any posting made by a moderated user is forwarded directly to the administrator, who can then edit, reject, or approve the message.

Despite administrative limitations, Web Crossing is one of the most extensible products in the roundup. Lundeen & Associates provides Web Crossing Template Language (WCTL), a native scripting language that gives you the power to **customize** nearly every aspect of your discussion site. Although WCTL is proprietary, any administrator familiar with scripting languages can master it quickly.

Web Crossing's end-user capabilities are unsophisticated. Posting messages is not difficult, but the program is a bare-bones affair that lacks support for embedded attachments or links.--HHH

Web Crossing 2.0.2. List price: $995 and up. Requires: 486-based PC or better, 16MB RAM, 10MB hard disk space, Microsoft Windows 95 or NT 3.51 or later. Lundeen & Associates, Alameda, CA; 510-521-5855; fax, 510-522-6647; www.lundeen.com. Choose 507 at www.pcmag.com/infolink.

Well Engaged: Well Engaged Discussions

Administrators of large commercial sites looking to avoid the hassles

of building and maintaining a discussion server should consider Well Engaged Discussions ($3,500 list, plus monthly charges). The product provides an excellent linear discussion model that features moderation, filtering, and a spell-checker. Message threading would make the product complete.

Setup consists of giving the company your customization requirements, graphics, and HTML; Well Engaged does the rest. The price includes up to 35 hours' setup and training; more costs $100 per hour. If you need further modifications, Well Engaged will implement your changes quickly.

Well Engaged Discussions gives the host user excellent moderation control. You can post or reject responses, edit posts, and specify where in a thread they belong. The filter blocks profanity and lets you add words to the "forbidden" list. Because the list is case-sensitive, new words must be entered in multiple ways.

The user **interface** is broken down into Conferences and Topics. Conferences are global organizational folders; Topics are folders within Conferences that hold individual discussions. Users can temporarily hide topics by marking them as forgotten, and the administrator can archive topics or "freeze" them, designating them read-only. You can also tag topics with a placemark.

Well Engaged Discussions offers a mix of searching and sorting options. The ability to search user profiles by geographical area or interests is unique. This product, the most sophisticated linear implementation we tested, lets you go to a posting by number, to the start of a discussion, and forward or back by increments of 20 messages. Although not as straightforward as the collapsible threads used by Expressions or WebBoard, Well Engaged Discussions' implementation is far easier than scrolling through the myriad documents in FirstClass or the Web-based version of Wildcat! Interactive Net Server.

Well Engaged Discussions offers basic messaging tools. Messages are entered as plain text, with no support for formatting or file attachments. However, a unique "hide" feature lets you collapse a long response, displaying it as a link in the discussion--a clever way to help users weed through tons of information quickly. The product's spell-checker features a **customizable** dictionary; the utility flags unrecognized words and lets you edit your response before posting.--Greg Alwang

Well Engaged Discussions 1.5. List price: Hosted version, $3,500, plus $250 a month for 101 to 500 users (no monthly fee for fewer users). Requires: **Internet** Explorer 3.01 or later or Netscape Navigator 3.0. Well Engaged, Sausalito, CA; 800-935-5880, 415-332-4335; www.wellengaged.com. Choose 508 at www.pcmag.com/infolink.

Mustang Software Inc.: Wildcat! Interactive Net Server

Wildcat! Interactive Net Server, Enterprise Edition ($3,995 list), is a Web-enabled version of Mustang Software's dial-up BBS program. Although BBS operators may appreciate the Web-based capabilities, administration controls, and customizing options, WIN Server's cluttered end-user **interface** and default linear messaging may make it a tough sell for everyone else.

Installation is simple, but using the management tools is much less straightforward. Like most BBS software, WIN Server requires many different tools to configure its various product components--a cumbersome and time-consuming process.

The flexible forum administration tools let you define forums as private, public, or moderated. There are automatic message expiration and archiving capabilities. A unique replication feature lets you export and replicate conferences to remote servers.

You **customize** the discussion site by editing HTML templates for specific site types, such as business, church, or school. If one of the templates meets your needs, you'll be up and running quickly.

The user **interface** includes frames and no-frames versions, though we found the frames version poorly designed. Because the server didn't synchronize the frames properly, we wound up with multiple frames containing duplicate information, frames within frames, and frames out of sync with other frames. Message threads are linear and are displayed by

top-level messages only, with postings displayed in reverse chronological order. A dividing line indicates where you left off reading.

More extensive end-user capabilities are available with Wildcat! Navigator, a free **browser** -launched application. It provides enhanced message display controls, threaded discussions, improved search functions, and message attachment capabilities.--SG

Wildcat! Interactive Net Server, Enterprise Edition. List price: $3,995. Requires: Pentuim-based PC, 16MB RAM with Microsoft Windows 95 or 32MB RAM with Windows NT 3.51 or 4.0, 200MB disk space. Mustang Software Inc., Bakersfield, CA; 800-999-9619, 805-873-2500; www.mustang.com. Choose 509 at www.pcmag.com/infolink.

DigitalFacades Corp.: Xpound!

Unix-based Xpound! HT 2.21 ($1,195 list) is an easy-to-install package that includes rich filtering, searching, and sorting features. But it's difficult to **customize** , it's slow, and it provides limited end-user message control.

Installing Xpound! is easy, and its documentation is sparse but adequate. The product runs on any Web server that uses Perl CGI with DBM (database management) support. A Windows NT version should be available by press time.

Administration is also straightforward: New users can either auto-register or access public forums as guests. Forums can also be private. Xpound! offers basic moderation and content filtering, but you'll need to build your own profanity list. And because the program lacks any smart logic for rejecting word variations, a word must match an entry exactly.

We found customizing the discussion site laborious. Because the **interface** design uses a separate set of HTML pages that use proprietary tags, making changes involved editing each page by hand.

The user **interface** is fairly good; the collapsible threads are indented for easy reading. The program tags each new message with an icon, and it can display new messages by day, week, month, or year. But though DigitalFacades Corp. claims you can edit and delete individual messages, we were able to delete only entire threads.

Xpound! includes fine searching and sorting tools. You can search by subject line, subject line and content, or author. And registered users who have set certain messages to use auto-notification can search for them if they want to turn off the feature. The program can sort by date and time, subject, author, and threads' traffic level.

Xpound!'s performance proved to be noticeably slower than the other packages' because of slow CGI execution of Perl scripts. The company plans to address this problem in a future release by implementing either FastCGI or Java.

Xpound! HT 2.21. List price: $1,195. Requires: Unix-based system with Perl CGI and DBM support, cookie-enabled Web server. DigitalFacades Corp., Santa Monica, CA; www.xpound.com. Choose 510 at www.pcmag.com/infolink.

Related article: Editors' Choice -- Expressions Interaction Suite 3.0

Web administrators need to be of two minds when shopping for a discussion server. Of course they want a product that's easy to set up and administer, with a broad array of management tools. But they also need to consider a package that's **customizable** , with features and functionality that will make users want to come back time and time again.

Only one product will satisfy administrators and users alike: eShare Technologies' Expressions Interaction Suite 3.0. Expressions has a wizards-based setup and rich message management. Its moderation control includes the ability to designate forums as read-only, plus message previewing and user-name filtering. The product's ability to add rotating banners and ads and to conduct Web tours of other sites is unique.

Site customizability is where Expressions, the only product to include easy-to-use WYSIWYG editing tools, really shines. Administrators will love the Color Picker for quickly changing background colors, and the Database Generator, which makes editing, adding, and removing discussion fields easy--without HTML editing.

Users will appreciate Expressions' ability to connect to other eShare

servers globally; its real-time chat rooms, intuitive **interface** , message threading, and text search; and its ability to embed messages with attachments and links.

Another product deserves honorable mention: O'Reilly & Associates' WebBoard 2.0. Though it lacks Expressions' slick user **interface** and filtering capability, and it requires an HTML maven to **customize** , the product is inexpensive and easy to set up. Management tools are extensive, headlined by peerless archiving capability. Users benefit from a full complement of messaging features that include a spell-checker, e-mail notification, and clever keyboard search capabilities.

The default user **interface** allows Web users read-only access to forums.

Message Boards' framed layout makes navigation extremely simple.

Players in the Field

In case you want to look beyond the products reviewed in our roundup, here's a partial list of Web discussion packages from smaller companies.

Prying Open Groupware

The major groupware vendors have not been standing still on integrating intranet (**browser** -based) access to their threaded discussion facilities. We took a look at four groupware packages with an eye toward Web-based threaded discussion: Lotus Domino Server 4.6 and Notes client, Microsoft Exchange Server 5.5 and Outlook 97 client, Novell's GroupWise 5.2, and Netscape Collabra Server 3.01 and Communicator client.

With the exception of Netscape Collabra Server, these packages have focused their attention on finding ways to integrate **Internet** (Usenet) discussions with their proprietary architectures. The result has been a richer set of options for interchanging NNTP discussions with Domino, Exchange, and GroupWise threaded discussions.

Lotus Domino Server ($1,495 list) natively supports the NNTP protocol, allowing both Notes clients and NNTP news readers to access discussion databases simultaneously in real time. Alternatively, Notes also lets Web **browser** users access the same discussions using Lotus's HTTP process to convert the Notes discussion application to HTML. (Lotus Development Corp., Cambridge, MA; 800-575-6887; www.lotus.com. Choose 511 at www.pcmag.com/infolink.)

Similarly, the public discussion folders in Microsoft Exchange Server ($999 list for five users) can be accessed via a **browser** using the Microsoft Outlook Web-access client. Of course, like Domino, MicrosoftExchange supports native NNTP, allowing news readers to access Exchange public discussions directly. (Microsoft Corp., Redmond, WA; 800-426-9400; www.microsoft.com/exchange. Choose 513 at www.pcmag.com/infolink.)

Our testing revealed that Novell's Groupwise ($718 list for five users) is still playing catch-up. Although Novell's new WebAccess product lets you access your GroupWise mail and calendar, it doesn't give you access to GroupWise discussions, nor does the product support the NNTP protocol. (Novell Inc., Provo, UT; 800-453-1267; www.novell.com/groupwise. Choose 514 at www.pcmag.com/infolink.)

Meanwhile, Netscape Collabra Server ($525 list for 50 users) has introduced a flip side to the **Internet** 's standard-based paradigm. Much of the new Collabra Server functionality, such as enhanced name and formatting, can be accessed only by way of Netscape Collabra Reader, part of Communicator 4.0. (Netscape Communications Corp., Mountain View, CA; 415-254-1900; home.netscape.com. Choose 515 at www.pcmag.com/infolink.)--Tony Pompili

The Web view of a Lotus Notes Client 4.6 discussion within Microsoft **Internet** Explorer 4.0 features an **interface** similar to that of the proprietary client.

Motet Conferencing provides a basic user **interface** that belies the package's power.

Proxicom J/Forum lets you add a user to a group with the press of a button.

NNTP and Listservs Go Corporate

An interesting alternative to Web-based discussion packages has

appeared on the scene: NNTP-based discussion products for Windows NT. While Unix-based NNTP (Network News Transfer Protocol) servers have traditionally been the domain of public discussion forums, or Usenets, two NNTP server packages--NetWin's Dnews 4.5 ($95 to $485 list) and MetaInfo's NewsChannel Pro for Windows NT 1.0 ($295 list) --leverage the power of the NNTP protocol for the corporate intranet. These products offer your workgroup access to more than 20,000

Usenet discussion groups and the ability to create private forums.

NNTP's administrative and end-user capabilities are robust. You can restrict server access to individuals based on a specified domain or IP address and retrieve only the newsgroups or hierarchies you wish. Dnews lets you configure basic spam filtering to control content further. Users can download unread messages and post responses later; most browsers include one. (NetWin Ltd., Mt.. Roskill, Auckland, New Zealand; 64-9-630-0689; www.netwinsite.com. Choose 519 at www.pcmag.com/infolink. MetaInfo, Seattle; 206-674-3700; www.metainfo.com. Choose 518 at www.pcmag.com/infolink.)

Another powerful approach to information distribution is e-mail: Electronic mailing lists (or Listservs) let you push your NNTP discussion directly to users. Long a staple of Unix servers, mailing-list products have become available in the recent past in Windows NT versions from both L-Soft international and Mustang Software.

Perhaps the best-known product in the category of pushing messages is L-Soft's Listserv Classic ($625 to $7,876 list). A scaled-down version of this model is also available. (L-Soft International, Landover, MD; 800-399-5449; www.lsoft.com.Choose 516 at www.pcmag.com/infolink.)

Mustang Software's ListCaster ($299 list) offers a Windows NT- or Windows 95-based solution that includes a powerful SMTP/POP3 server and quick integration with your existing Web server. (Mustang Software Inc., Bakersfield, CA; 800-999-9619; www.mustang.com. Choose 517 at www.pcmag.com/infolink.).

Special Features: table; illustration
Company Names: eShare Technologies Inc.--Products; SoftArc Inc.--Products; ichat Inc.-- Products; Bryan Higgins Software--Products; Proxicom Inc. (McLean, Virginia)--Products; O'Reilly and Associates Inc.--Products; Lundeen and Associates--Products; WELL Engaged--Products; Mustang Software Inc.-- Products; Digital Facades Corp--Products
Descriptors: Internet /Web Server Software; Workgroup Software; Software Multiproduct Review
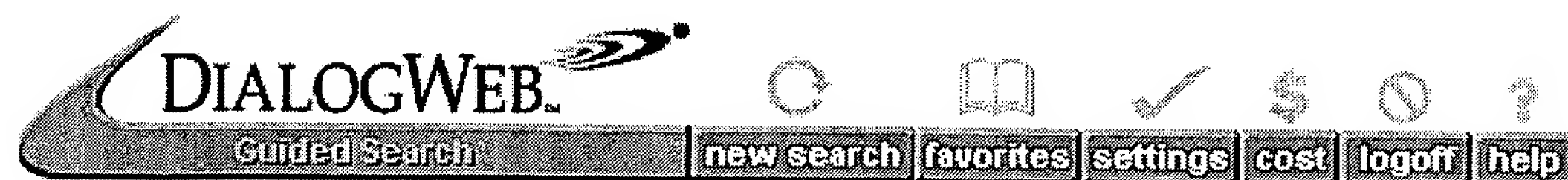**Product/Industry Names:** 7372682 (Internet Server Software); 7372630 (Workgroup Software)
SIC Codes: 7372 Prepackaged software
Ticker Symbols: MSTG
Trade Names: Expressions Interaction Suite 3.0 (**Internet** /Web server software)-- Evaluation; Message Boards 1.01 (**Internet** /Web server software)-- Evaluation; Motet Conferencing Software 1.26 (**Internet** /Web server software)--Evaluation; Proxicom J/Forum (**Internet** /Web server software)-- Evaluation; WebBoard 2.0 (**Internet** /Web server software)--Evaluation; Web Crossing 2.02 (**Internet** /Web server software)--Evaluation; Well Engaged Discussions 1.5 (**Internet** /Web server software)--Evaluation; FirstClass Intranet Server 5.1 (Workgroup software)--Evaluation; Wildcat! Interactive Net Server (**Internet** /Web server software)--Evaluation; Xpound! HT 2.21 (**Internet** /Web server software)--Evaluation
File Segment: CD File 275

DIALOGWEB

Guided Search | **new search** | **favorites** | **settings** | **cost** | **logoff** | **help**

Dynamic Search: Computers, Electronics, and Telecommunications

Records for: *toolbar*

save as alert...   save strategy only...

Output   Format: Full Record   Destination: Browser   display / send

Modify   refine search   back to picklist

select
all none   **Records   22   of   154   In full Format**

☐ 22. **3/9/22 (Item 22 from file: 275)**
02166245   **Supplier Number:** 20044503 **(This Is The** FULL TEXT **)**
The new HTML Help system extends online help from the desktop to the Web.
(Microsoft's HTML Help Workshop online help authoring software) (Product Support)

Faison, Ted
Microsoft Systems Journal , v13 , n1 , p55(14)
Jan , 1998
ISSN: 0889-9932

Language: English   **Record Type:** Fulltext; Abstract
Word Count: 6529   **Line Count:** 00721

Abstract: Microsoft's HTML Help Workshop (HHW) is the help authoring tool for HTML Help, its next-generation online documentation system. HTML Help incorporates all of the basic features of Microsoft's WinHelp 4.0 documentation engine and adds a number of new features, including a completely redesigned user **interface** . HHW is a relatively bare-bones MFC application which has been left open to the development of third-party tools. HTML Help supports HTML, text, graphics, Java applets and ActiveX controls. Frames are used to create a default tri-pane arrangement that displays the **ToolBar** , a table of contents and a view pane. HHW's HTML Help Image Editor captures and views screen images in image formats including BMP, GIF and JPEG. The compressed versions of a project's files are stored in a compiled file to support features that are best implemented through the use of a single file. HHW also includes a built-in wizard for converting WinHelp projects into HTML Help formats.

Text:

```
 The new HTML Help system represents an evolutionary step in online
documentation systems. Until the advent of Web browsers, Microsoft relied
on essentially two methods for displaying documentation. The most common
used the WinHelp engine, which was adequate for simple systems. The other
system used a Microsoft program called InfoView, and was developed to
satisfy users who needed to locate help documentation on the numerous
Microsoft(R) Developer Network CDs.

All of the basic features in WinHelp 4.0 were ported to the new system and
the user interface  has been completely redesigned. Apart from the switch
to HTML, a number of new features were added When you open atypical HTML
Help window, you immediately see something that looks like a mix between
the Windows Explorer and Microsoft Internet  Explorer. A typical help
window is shown in Figure 1. By default, the window opens in the
upper-right corner of the screen. The height of the window is set to
```

display all the text available, if possible. If there is too much text, a vertical scrollbar is added automatically.

(Figure 1 ILLUSTRATION OMITTED)

The HTML Help system lets users locate information either through a table of contents (TOC) or through an index. HTML Help windows are usually tri-pane, meaning they contain three standard panes. There are ways to control the overall appearance of your help window, so it doesn't necessarily have to contain all three panes, but the tri-pane arrangement is the default. The top pane is for the **ToolBar** , the bottom-left pane is for the TOC, and the bottom-right is where the help topics are displayed.

The navigation and topic panes both use COM objects to display their contents. The navigation pane is painted using code provided by the new HTML Help ActiveX(TM) control, HHCTRL.OCX which supports all the navigation controls for the system, including the TOC and index. Navigation controls are based on new sitemap files, which are HTML files containing the text to display and additional information for hyperlinks, layout controls, fonts, bitmaps, and so on.

The topic pane is implemented with the same MSHTML ActiveX **object** used in **Internet** Explorer. MSHTML parses HTML streams and displays the text, graphics, Java applets, ActiveX controls. MSHTML is hosted by another ActiveX control, SHDOCVW, also known as the Layout Manager. SHDOCVW is essentially a wrapper that adds a number of high-level functions, including navigation functions. SHDOCVW doesn't actually know how to travel through hyperlinks--it leaves that task to lower-level COM objects contained in HLINK.DLL, URL.DLL, URLMON.DLL, and other DLLs.

HTML Help Workshop

The Microsoft tool for developing HTML Help systems is HTML Help Workshop (HHW), which is available at http://www.microsoft.com/workshop/author/htmlhelp. It is a fairly bare-bones MFC application, and Microsoft deliberately left the door open for third-party tools. HHW lets you create TOCs, indexes, compiled files, and HTML files. It also allows you to test your documents by displaying them in a minibrowser. Figure 2 shows a typical HHW session. The left pane uses the same HHCTRL ActiveX control you'll use in your own help windows.

(Figure 2 ILLUSTRATION OMITTED)

HHW has a number of wizards to simplify common tasks like embedding the HHCTRL ActiveX control in HTML documents. Most of these wizards become available after at least one HTML file is associated with a project. Once this is done, the wizards are available from the HHW **toolbar** or the Tags menu. The Compile command compiles an entire HTML Help project into a single file. Compiled files are useful for several reasons. First, they are small, so they are well-suited for Web deployment. Second, certain features such as full-text searching are available only with compiled files.

Once you create your help files with HHW, there are two ways for users to view them. The simplest is with a standard Web **browser** . Because all the files are written in HTML, any **browser** that supports ActiveX can be used. And if you really want to support browsers that aren't ActiveX-aware, you can instead embed the navigation controls as Java applets, a process I'll describe later. The most typical way users get to your HTML Help system is through a Help menu in your application. Menu commands can be used to programmatically create a help window using an HtmlHelp API function.

Creating a Help System

HTML Help systems often display a TOC on the left side and a topic window on the right. To accomplish this layout, you use frames. You simply create a two-frame document and give the frames names like left and right. You'll refer to these names later to designate which frame your commands should apply to. The following code will create a two frame window:

The frames also designate which HTML file is loaded by default. The left pane loads a file that uses an embedded HHCTRL ActiveX control to support navigation features. Having created a new TOC, you can use HHW to add entries and **customize** it. Indexes are created and managed in a similar manner. At any time you can click the Display In **Browser** button to preview how your HTML pages will look.

You can structure the entries shown in the TOC to support different classes of users with Information Types (IT). HHW also comes with a built-in tool, called the HTML Help Image Editor, to capture and view screen images. It supports common image formats like BMP, GIF, and JPEG. The Image Editor lets you manage the images used in your help system, but keep in mind that it wasn't designed to be a full-blown graphics production system.

Compiled Files

Certain HTML Help features are best implemented when all the information in your help system is stored in a single file. Because HTML Help systems use URLs as links, a single system could reference documents scattered all over the **Internet** . To support those features that need to access all your topics at once--like full-text search--you must use compiled files.

Compiled files are nothing more than CAB files that store a compressed version of all your project files in a single file with a .chm extension. Compiled files contain the text of multiple HTML files. You can assign an alias to each file and use this alias in some of the commands in the HtmlHelp API function call. The aliases are used only in compiled files. To assign an alias, click the HtmlHelp API Information button in the HHW Project pane and select the Alias tab, then click the Add button.

Aliases are just numeric values that represent HTML files. For example, the HH_HELP_CONTEXT command can be used to display a single topic in a compiled file:

HtmlHelp(HH_HELP_CONTEXT, "MYCOMPILEDFILE.CHM", 100);

The second parameter is the name of the compiled file that contains the topics. The third parameter is the alias number of the topic.

Navigating HTML Help Content

Online documentation systems require a way to show the user the layout and organization of the documents and a way to get around in the system. Users need the same kinds of features found in printed documentation, such as a TOC and index. But online systems can do better, giving users the ability to do full-text searches and queries to locate words or phrases anywhere in the documentation system.

HTML Help documents are designed to be viewable with a Web **browser** , but HTML itself doesn't support navigation control except for hyperlinks. The solution was to create a special control that could be embedded in HTML documents. Microsoft initially created it as an ActiveX control, but since not all browsers support ActiveX, there's also a Java apples that provides similar functionality.

Many of the HTML Help features are provided by the HHCTRL ActiveX control. If you plan to use any of these features, you need to embed the control on an HTML page. You can do it the hard way or the easy way. The hard way entails writing HTML code to hook in the ActiveX control, plus additional code for optional parameters. The easy way is to use the HHW Wizard.

The HHCTRL ActiveX control supports a whole slew of features, but not all can be accessed through HTML parameters. To access all the ActiveX features you need to programmatically call the HtmlHelp API function, which is exported from HHCTRL.OCX. Figure 3 shows the features you can access using the HHW Wizard.

Figure 3 HHCTRL Features Available in HHW

Feature	Description
HHCTRL Version	Adds button to the HTML page. When clicked, a small message box appears with the version number of the HTML Help ActiveX control.

Index	Displays an index file, which is an HTML file with the suffix .hhk.
Related Topics	Adds a button to the HTML page. When clicked, a popup menu or window appears with a list of related topics.
Shortcut	Adds a shortcut button to the HTML page. When clicked, the button launches a program.
Splash Screen	Allows you to specify a bitmap to be displayed when a given document (generally the title page) is displayed. The image stays on the screen for the specified length of time.
Table of Contents	Displays a table of contents file, which is an HTML sitemap file with the suffix .hhc.
WinHelp Topic	Adds a button to the HTML page. When click, the old WinHelp 4.0 engine is invoked and you can bring up help topic in a popup window or frame.
Close Window	Adds a button to the HTML page to close the help window.

As a simple example, you can add a button to a topic page that displays a small message box with the version of the HHCTRL ActiveX control. Using the HHW Wizard, inserting the button is trivial. You can choose to have the button display whatever caption you want. The wizard generates the following HTML code and inserts it in the selected HTML file:

```
<OBJECT  id-hhctrl type-"application/x-oleobject"
classid-"cisid:adb880a6-d8ff-11cf-9377-00aa003b7a11"
codebase-"hhctcl.ocx#Version-4,71 ,1111,0"
   width-100
   height-100>
```

```
OBJECT >
```

Version information is designed primarily to aid developers during debugging, not for users to see.

To demonstrate the features on the HTML Help system, I created a small documentation system for a fictitious travel agency called Your Travels. I'll be using code fragments from this example throughout the article.

To display an index in an HTML file, you need an index sitemap file, which has an .hhk extension. You embed the HHCTRL ActiveX control on the page and pass it the name of the sitemap. You can create .hhk files manually with a tool like Notepad or with HHW. Building an index is not automatic. You have to add entries to it, declaring keywords and the topics they are linked to. You add entries by clicking the "Insert a keyword" button on the index pane in HHW.

For each index entry, the wizard adds a record to the sitemap, like this:

-   <OBJECT type-"text/sitemap">

```
        OBJECT >
```

The ITs in the dialog box are not supported for indexes under HTML Help 1.0. ITs are a way to categorize the contents of your Help system, allowing users to obtain customized information based on the selected ITs.

Once you have a sitemap with indexed entries, creating an index is a matter of using the HHW Wizard to insert the HHCTRL ActiveX control into the document. Clicking keywords in the index displays the linked topic in the right pane.

```
<OBJECT  id=hhctrl type="application/x-oleobject"
classid="clsid:adb880a6-d8ff-11cf-9377-00aa003b7all"
codebase="file:hhctrl.ocx#Version=4, 0, 0, 20"
        width=248
        height=300>
```

OBJECT >

You can put objects on a page so users can click on them to see links to other topics. These objects are normally used as references to related topics, or "see also" features. If all you want is a link to another topic, just use a simple hyperlink.

The HHW Wizard lets you create lists of related topics as buttons, popup menus, or dialog boxes. Buttons act just like ordinary hyperlinked text: you click them and the **browser** goes to the linked page. Popup menus are useful for short lists. The popup window will automatically get scrollbars if the list doesn't fit in the window, so it can handle any number of items.

Dialog boxes are useful when the number of topics to display is long. Links to related topics are encoded as URLs. You can mix local and remote URLs, significantly blurring the boundaries of your help system. The wizard lets you insert the HHCTRL ActiveX control into an HTML document with parameters to support related topics. Your HTML document will have a button embedded on it. If you requested a popup menu, the code will look like this:

```
<OBJECT  id=hhctrl type="application/x-oleobject"
classid="clsid:adb:adb880a6-d8ff-11cf-9377-00aa003b7all"
codebase="file:hhctrl.ocx#Version=4, 0, 0, 24"
        width-80
        height=20>
```

OBJECT >
Shortcuts

A shortcut is a button users can click on to launch a secondary program. Say you want to open a form that collects information from the user. A shortcut button could launch a standalone program to get the user data and send it to your Web server. Shortcuts appear as buttons, with optional text or a bitmap for the caption. To add a shortcut to an HTML

page, you need to embed the HHCTRL ActiveX control on the page and pass it three parameters, like this:

```
<OBJECT id=hhctrl
type="application/x-
            oleobject"
classid="clsid:adb880a6-
d8ff-11cf-9377-00aa003b7all"
codebase="hhctrl.ocx#Version=4, 71, 1111, 0"
      width=100
      height=100>
```

```
      value=", C:/MyTopics/TellUs.exe,">
OBJECT >
```

Keep in mind that programs launched by a shortcut can't return a status code to their caller like modal dialog boxes do. The programs execute independently of your help window and don't close automatically when your help window closes.

Splash Images

When the user accesses your documentation system, you might want to display a splash window. The HHCTRL ActiveX control allows you to display a splash window anytime a given document is displayed. Using HHW, select the HTML document that will have the splash window, then use the wizard to add the HTML code. The wizard lets you specify the file name of the splash image and the length of time to show it.

I captured an image off the screen using HTML Help Image Editor, then saved it as SPLASH.GIF in the directory with the rest of my documentation files. When I ran the HHW Wizard, I embedded the HHCTRL ActiveX control on my title page, selected the Splash option with my GIF file, and requested a three-second duration. That's it. Loading the title page with a **browser** causes the splash window to appear (see Figure 4). Here's the code the wizard generated to create the three-second splash window:

```
<OBJECT id=hhctrl type="application/x-object "
classid="clsid:adb880a6-d8ff-11cf-9377-00aa003b7all"
codebase=hhctrl.ocx#Version=4, 7, 1, 630">
```

```
      value="Splash.gif">
```

```
OBJECT >
```

(Figure 4 ILLUSTRATION OMITTED)

The splash duration is measured in milliseconds. You can use GIF or BMP images.

Tables of Contents

HTML Help TOCs are special HTML files with .hhc extensions. These files represent sitemaps. Although you obviously can create a TOC by hand using a text editor like Notepad, the easy way is with HHW. To use a sitemap in your documentation system, create an HTML page and embed the HHCTRL ActiveX control, passing it the name of the sitemap. The HHW TOC

wizard makes the process simple, creating HTML code that looks like this:

```
<OBJECT  id=hhctrl type="application/x-
                oleobject"
classid="clsid:adb880a6-d8ff-11cf-9377-000aa0003b7all"
codebase="file:hhctrl.ocx#Version=4, 0, 0, 20"
        width=250
        height=270>
```

OBJECT >

The preferred way to show a TOC is in the left pane of a multiple window.

Clicking entries in the TOC changes the topic shown in the right pane. You can change this arrangement by indicating the name of the topic pane in the sitemap file. You could even make the TOC appear by itself, or in a pane at the top of the window.

Using the Table of Contents Properties dialog box in HHW, you can **customize** the way the TOC appears, including its font, treeview styles, and bitmaps. The HHCTRL ActiveX control that displays the TOC uses an image list to display bitmaps for each entry in the TOC. The built-in image list looks like Figure 5. Each bitmap is 16 x 16 pixels.

(Figure 5 ILLUSTRATION OMITTED)

To select a bitmap for a TOC entry using HHW, click the Edit Selection button in the Contents pane. In the Advanced tab there is a spinner edit control for selecting the image index. The spinner uses a 1-based image index. You can **customize** the TOC by creating your own image list as a BMP file using a tool like Microsoft Developer Studio(TM). The image list must consist of a series of bitmaps. To select your image list, click the Contents Properties button on the Contents pane in HHW and enter your image list file name.

Information Types

Documentation systems are often created to support different kinds of users. For example, a financial system might have information designed for accountants, analysts, and executives. Each group should see only those entries created for them. Accountants should be able to filter out the entries created for analysts and executives.

HTML Help systems accomplish this kind of filtering by grouping topics together using ITs. When the user selects an IT, the TOC only displays topics that belong to that IT. An IT is just a string that you use to group your topics. You might want to organize topics by the level of experience of the user, so you would have types like Beginner or Advanced. Useful types might also be What's New, How-To, Overview, FAQ, or On the Web. For even more control, you can group ITs into Categories. In my Travel Agency example, I could have used categories to distinguish topics by destination, by length of travel, and by cost of travel (see Figure 6).

(Figure 6 ILLUSTRATION OMITTED)

To create ITs in HHW, click the Contents properties in the Contents pane and select the Information Types tab. When you add a new IT, you have the choice of making it inclusive or exclusive. The former allows the user to choose topics from that IT along with others. The latter allows the user

to see the topic in the IT, excluding other ITs.

You use ITs with TOC entries. Using HHW, select an entry in the TOC, then click the Edit Selection button. The Information Types tab lets you associate the entry with one or more ITs. When the user opens the help window, the TOC displays entries for all the ITs. To select a subset, the user right-clicks the TOC and selects the **Customize** command. This launches a wizard.

The HtmlHelp API is also designed so you can select ITs programmatically, but the feature wasn't quite ready in time for the release of version 1.0.

You aren't required to use ITs in your HTML Help projects. If a topic doesn't reference one, it will always be displayed, regardless of the IT selected.

The Java Applet

If you want to allow users to view your HTML Help system with browsers that don't support ActiveX, you can embed the HHCTRL control as a Java apples. Keep in mind that the Java version doesn't support all the features you'll get with the ActiveX control, and it's much slower, too.

The Java version supports TOCs, indexes, and related topics. To use the apples, create your sitemap (TOC and index files) using HHW in the usual manner. There is no wizard to insert a Java apples into an HTML file, so you have to type the code in yourself. The following will create a TOC:

Make sure you type HHCtrl.class with the exact upper and lower case, otherwise you'll get a "class not found" error when the Java Runtime Environment tries to load it. The HTML Help documentation says to include a codebase directive in the APPLET statement, but I wasn't able to get it to work. Using a codebase directive seems to interfere with the apples's ability to find and load the sitemap files. You need to copy all the Java support files contained in the HHW java subdirectory to the directory that contains your HTML documents. Make sure that your .hhc and .hhk sitemap files, plus all your other help files, are in the same directory.

Creating HTML Help Windows Programmatically

You can view HTML Help topics either using a **browser** or programmatically. The first approach displays your documents within the context of the **browser**, so the user gets whatever **toolbar** the **browser** provides. The second approach does away with the **browser**, creating a standalone window. The advantage of this approach is that the help documents are displayed in a window you have control over, so you can set

the **toolbar** buttons, receive notifications, and control the exact appearance of the window.

Programmatic access to the HTML Help system is implemented by the HtmlHelp API function through an extensive list of commands and parameters. This essential function is exported from HHCTRL.OCX and declared like this:

```
HWND HtmlHelp (HWDN hwndCaller, LPCTSTR pszTitle,
          UINT iCommand, DWORD dwData);
```

There are two versions of the declaration: HtmlHelpA for ANSI strings and HtmlHelpW for Unicode (wide) strings. Other than the character set they are identical, so I'll describe the ANSI version. A #define statement in HTML-HELP.H selects one function or the other:

```
#ifdef UNICODE
#define HtmlHelp HtmlHelpW
#else
#define HtmlHelp HtmlHelpA
#endif // !UNICODE
HWND WINAPI HtmlHelpA(HWND hwndCaller, LPCSTR pszFile,
          UINT uCommand, DWORD dwData)
HWND WINAPI HtmlHelpW(HWND hwndCaller, LPCSTR pszFile,
          UINT uCommand, DWORD dwData)
```

Before using HtmlHelp in your program, you need t include HTMLHELP.H, which contains the definitions fo the commands and parameters you can use

As with any function exported from a DLL, you can loa it implicitly or explicitly. To load implicitly, you link you application with the import library HHCTRL.LIB and jus use HtmlHelp in your code as a regular function. When you application loads, the Windows loader will automaticall load HHCTRL.OCX, so you'll call the API function like this

```
#include "HtmlHelp.h"
HWND wnd = HtmlHelp (...)
```

To load explicitly, you use GetProcAddress and access the API through the returned function pointer. You can load either by name or ordinal. To load by name, use the string HtmlHelpA or HtmlHelpW. To load the ANSI function, you would write something like this:

```
#include "HtmlHelp.h"
          :
          .

typedef HWND (WINAPI (*)FPHH) (HWND, LPCSTR, UINT,
          DWORD);
FPHH htmlHelp;
HINSTANCE inst = LoadLibrary ("HHCTRL.OCX");
(FARPROC&) htmlHelp = GetProcAddress (inst,
          "HtmlHelpA");
HWND wnd = html (m_hWnd,
     "file://c:/MyFile.htm",
     HH_DISPLAY_TOPIC, NULL);
```

To load by ordinal, you should use the symbolic names ATOM-HTMLHELP-API-ANSI or ATOM-HTMLHELP-API-UNICODE, like this:

```
(FARPROC&) htmlHelp = GetProcAddress(inst,
          ATOM_HTMLHELP-API_ANSI);
```

When calling HtmlHelp, the first parameter is the handle of the calling window. Some help windows you create can send messages, and the calling window will receive them. For example, if you create a help system that has a **toolbar**, the help window can send WM_NOTIFY messages to the calling window when the user clicks a button. The calling window also owns and controls the visibility of the help window. This is an important new feature because WinHelp windows were owned by the Desktop and their visibility was not controlled by the calling app. With HTML Help windows, the owner is generally your application. When you switch to another app, the Help window is hidden. If you hide or minimize your app, the Help window is also hidden or minimized. If you close your app, the Help window is closed.

The HtmlHelp API is a versatile function and accepts all C kinds of commands and parameters to create and manipulate help windows. Figure 7 describes the commands. I'll get to the parameters shortly.

Figure 7 HtmlHelp API Commands

Command	Description
HH_DISPLAY_TOPIC	Creates a window containing only a topic pane displaying HTML text. The HTML content is laid out using an MSHTML embedded control.
HH_HELP FINDER	Same as HH_DISPLAY_TOPIC.
HH_DISPLAY_TOC	Not supported in version 1.0.
HH_DISPLAY_INDEX	Not supported in version 1.0.
HH_DISPLAY_SEARCH	Not supported in version 1.0.
HH_SET_WIN_TYPE	Sets the parameters for the windown created by the HtmlHelp function. Can be used to create a new window or to modify an existing one. You refer to existing windows using their Type Name, which is the string you indicate in the pszType field of the HH-WINTYPE structure when you create the window.
HH_GET_WIN_TYPE	Returns the parameters for a given window, specified by Type Name, using the pszType field of the HH_WINTYPE structure.
HH_GET_WIN_HANDLE	Returns the handle for a given window, specified by Type Name, using the pszType field of the HH_WINTYPE structure.
HH_GET_INFO_TYPES	Not supported in version 1.0.
HH_SET_INFO_TYPES	Not supported in version 1.0.
HH_SYNC	Syncs the TOC with the topic pane. If that topic is not found in the TOC, no errors occur and the TOC is left unchanged. There are two ways to make the topic change: by selecting items using the TOC and by clicking links in the topic pane. Using the latter

approach, the TOC becomes out of sync
with the topic pane.

HH_ADD_NAV_UI   Not supported in version 1.0.
HH_ADD_BUTTON   Not supported in version 1.0.
HH_GETBROWSER_APP   Not supported in version 1.0.
HH_KEYWORD_LOOKUP   Not supported in version 1.0.
HH_DISPPLAY_TEXT_POPUP   Shows text in a simple popup window.
                       The unformatted text is displayed in a
                       single, selectable font. Text can be
                       provided in a String resource or as a
                       null-terminated char array. Displaying
                       text from a file is not supported in
                       version 1.0.
HH_HELP_CONTEXT   Displays a help topic in a window. The
                       topic is contained in a complied HTML
                       (.chm) file. The topic is referenced by
                       the alias assigned to it in the HTML
                       Help project file.
HH_TP_HELP_CONTEXTMENU   Displays a text popup window showingf the
                       contents of an HTML file.
HH_TP_HELP_WM_HELP   Similar to HH_TP_HELP_CONTEXT.

Normally, the first call you make to the HtmlHelp API is to create a
help window. There are several ways to create windows, based on what you
want to display. The simplest is to use the HH_DISPLAY_TOPIC command, which
will create a window with formatted HTML text in it. If the text contains
links, the user can click on them to navigate to linked documents, just as
with a regular Web **browser** .

HWND wnd = HtmlHelp(_hWnd,
    "file://C:/MyTopics/TravelPackages.htm",
    HH_DISPLAY_TOPIC, NULL);
If (wnd == NULL) MessageBox("No window created."):

This code displays the contents of the file TravelPackages.htm from
the local file system in a default window. The window will have the styles
WS_THICKFRAME
WS_OVERLAPPED I WS_VISIBLE, which is just are sizable window with a blank
caption bar, as shown in Figure 8. For the HTML file name in the second
parameter, you can also use Web URLs--in fact, the default is an HTTP URL.
The file name www.microsoft.com/default.htm would default to
http://www.microsoft.com/default.htm and display the Microsoft home page.
You can subsequently use the HH_SET_WIN_TYPE command to **customize** the
location, size, title, color, and font of the help window.
(Figure 8 ILLUSTRATION OMITTED)

Sometimes you need to open a small window containing only text. Maybe
you want to describe a word or command. The text doesn't need to have any
special formatting, pictures, or links. This kind of window gets created
very quickly compared to a full-blown, tri-pane window with **toolbar** and
TOC. Text-only windows are created by using the HH_DISPLAY_TEXT_POPUP
command with an HH_ POPUP structure. You can display text contained in a
resource file or in a char array, but HTML Help 1.0 doesn't support
displaying text from a text file in a text popup.

Here s how you would use HH_DISPLAY_TEXT_POPUP to display a char array:

```
# include "HtmlHelp.h"


HH_POPUP popupText = {
    sizeof(HH_POPUP), // cbStruct;
 NULL,              // hinst;
 NULL,              // idString;
 "Check this out!",   // pszText;
 {100, 100},         // pt;
 (DWORD) -1,        // default
            // clrForeground;
 (DWORD) -1,       // default
            // clrBackground;
 {-1, -1, -1, -1},   // default
               // rcMargins;
 NULL      // default pszFont;
};
HWND wnd = HtmlHelp(m_hWnd, NULL,
        HH_DISPLAY_TEXT_POPUP,
        (DWORD) &popupText);
```

The HH_POPUP structure allows you to set the foreground and background colors of the window. Using-1 selects the default colors. The pt field specifies the coordinates of the top-left corner of the window. (The HTML Help documentation incorrectly states that pt refers to the top-center point of the window.) You can also set margins around the text by using the rcMargins field.

To display text from a resource file, set the HH_POPUP fields hinst and idString. The hinst field is the instance handle used to load string resources. idString is the resource ID of the string. Here's how you would set up the HH_POPUP structure to display text from a resource:

```
HH_POPUP popupText = {
    sizeof(HH_POPUP),        // cbStruct;
    AfxGetInstanceHandle(),   // hinst for this module
    IDS_STRING_CHECKTHISOUT,  // idString;
    NULL,              // pszText;
    {100, 100},         // pt;
    (DWORD) -1,          // default clrForeground;
    (DWORD) -1,          // default clrBackground;
    {-1, -1, -1, -1},      // default rcMargins;
    NULL              // default pszFont;
};
```

Text popups stay on the screen until you press a key or click the mouse. The MFC function AfxGetInstanceHandle returns the instance handle for the currently executing module. If your app is not written using MFC, you can get the instance handle by calling the GetModuleHandle API function with a NULL argument. You can also use the instance handle of a DLL if your resources are stored there.

The most elaborate type of help window is the tri-pane variety described earlier. Showing a tri-pane window requires two steps: creating

it and displaying something in it. Creating the window is a matter of setting up an HH_WINTYPE structure and passing it to HtmlHelp with an HH_SET_WIN_TYPE command. The structure is complex, allowing you to specify almost every possible option for the tri-pane window, including the number and appearance of **toolbar** buttons, the size of the three panes, the window style, the ITs supported by the HHCTRL ActiveX navigation control, and so on.

The HTMLHELP.H include file has comments for each field. Because the structure is complex and the comments rather concise, I decided to provide additional information about each field, as shown in Figure 9.

(Figure 9 ILLUSTRATION OMITTED)

To see how everything fits together, you really need to see some code. Figure 10 creates a fairly complete tri-pane help window, with tabs in the navigation pane and all the **toolbar** buttons available. The button glyphs are fixed--take 'em or leave 'em. The code produces the window shown in Figure 11. The last two buttons on the right are **custom** buttons, referred to as Jump1 and Jump2, that you can tie to your own URLs. Notice that the first call to HtmlHelp creates the window and the second one displays it. The first call creates a window with the type name of MyWindow, which is used in the second call, preceded by the > character.

```
Figure 10 A Tri-pane Window
#include "htmlhelp.h"
// ...
// handles of the various windows created
HWND hwndHelp;          // the tri-pane window main frame
HWND hwndToolBar;       // top pane
HWND hwndNavigation;    // bottom left pane
HWND hwndHTML;          // bottom right pane
LPCTSTR windowTypeName = "MyWindow";
LPCTSTR windowCaption = "YourTravels Inc.";
HH_WINTYPE winTYPE = {
    sizeof(HH_WINTYPE),   // cbStruct
    FALSE,                // fUniCodeStrings
    windowTypeName,       // pszType
    HHWIN_PARAM_PROPERTIES
// fsValidMembers
    HHWIN_PARAM_TABPOSHHWIN_PARAM_TB_FLAGS,
    HHWIN_PROP_TRI_PANE,  // fsWinProperties
    windowCaption,        // pszCaption
    NULL,                 // dwStyles
    NULL,                 // dwExStyles
    {0},                  // rcWindowPos
    0,                    // nShowState
    hwnHelp,              // hwndHelp
    m_hWnd,               // hwndcaller
    NULL,                 // paInfoTypes
    hwndToolBar,          // hwndToolBar
    hwndNavigation,       // hwndNavigation
    hwndHTML,             // hwndHTML
    0,                    // iNavWidth
```

```
    {0},              // rcHTML
    "file://c:/MyTopics/TableOfContents.hhc",   // pszToc
    "file://c:/MyTopics/Index.hhk",           // pszIndex
    "file://c:/MyTopics/Default.htm",          // pszFile
    "file://c:/MyTopics/Default.htm",          // pszHome
    HHWIN_BUTTON_EXPAND
  // fsToolBarFlags
    HHWIN_BUTTON_BACK
    HHWIN_BUTTON_FORWARD
    HHWIN_BUTTON_STOP
    HHWIN_BUTTON_REFRESH
    HHWIN_BUTTON_HOME
    HHWIN_BUTTON_JUMP1
    HHWIN_BUTTON_JUMP2
    HHWIN_BUTTON_OPTIONS,
    0,            // NotExpanded
    0,            // curNavType - - not supported in
                  Version 1
    HHWIN_NAVTAB_TOP,   // tabpos
    0,            // idNotify
    {0},           // tabOrder (HH_MAX_TABS + 11)
    0,            // cHistory - - not supported in
                  Version 1
    "France",                // pszJump1
    "Italy",                 // pszJump2
    "file://c:/MyTopics/France.htm",   // pszUrlJump1
    "file://c:/MyTopics/Italy.htm",    // pszUrlJump2
    {0}           // rcMinSize - - not supported in
                  Version 1
};
HWND wnd = HtmlHelp(m_hWnd, NULL, HH_SET_WIN_TYPE,
 (DWORD) &wintype);
wnd = HtmlHelp(m_hWnd, "file://C:/MyTopics/TravelPackages.htm>
 MyWindow",
HH_DISPLAY_TOPIC, NULL);
```

(Figure 11 ILLUSTRATION OMITTED)

Commands and Parameters

Creating a standalone help window programmatically is just a matter of calling a single API function, but the number and combination of possible parameters makes the task sometimes less than trivial. Figure 7 briefly describes the commands accepted by the HtmlHelp API. The parameters required by each command are described in Figures 12 through 14.

(Figure 7 ILLUSTRATION OMITTED)

Figure 12 HH_WINTYPE Structure Members

Field to Change	Flag to Set in fsValidMembers
fsWinProperties	HHWIN_PARAM_PROPERTIES
dwStyles	HHWIN_PARAM_STYLES
dwExstyles	HHWIN_PARAM_EXSTYLES
rcWindowPos	HHWIN_PARAM_RECT
iNavWidth	HHWIN_PARAM_NAV_WIDTH

nShowState   HHWIN_PARAM_SHOWSTATE
paInfoTypes   HHWIN_PARAM_INFOTYPES
fsToolBarFlags   HHWIN_PARAM_TB_FLAGS
fNotExpanded   HHWIN_PARAM_EXPANSION
tabpos   HHWIN_PARAM_TABPOS
tabOrder   HHWIN_PARAM_TABORDER
cHistory   HHWIN_PARAM_HISTORY_COUNT
curNavType   HHWIN_PARAM_CUR_TAB

Figure 13 fsWinProperties Member of the HH_WINTYPE Structure

Flag   Description

HHWIN_PROP_ONTOP   Makes the help window stay on top of
                    all other windows.

HHWIN_PROP_NOTITLEBAR   Removes the title bar from the
                    help window.

HHWIN_PROP_NODEF_STYLES   Don't use default window style on
                    help window. Use the style set in
                    the dwStyles field of HH_WINTYPES.

HHWIN_PROP_NODEF_EXSTYLES Don't use default extended window
                    style on help window. Use the style
                    set in the dwExStyles field of
                    HH_WINTYPES.

HHWIN_PROP_TRI_PANE   Use a tri-pane window. The screen is
                    divided into three panes. The top is
                    for the **browser toolbar** . The
                    bottom-left is the navigation pane
                    containing the TOC control. The
                    bottom-right pane is the content
                    pane, displaying the selected help
                    topic.

HHWIN PROP_NOTB_TEXT   Don't display text on
                    toolbar buttons.

HHWIN_PROP_POST_QUIT   Post a WM_QUIT message to the owner
                    application when the help window
                    is closed.

HHWIN_PROP_AUTO_SYNC   Automatically update the TOC when the
                    user changes topics if the topic is
                    in the TOC.

HHWIN_PROP_TRACKING   Send notification messages to the
                    calling window.

HHWIN_PROP_TAB_SEARCH   Add a Search tab to the
                    navigation pane.

HHWIN_PROP-TAB_HISTORY   Not supported in version 1.0.

HHWIN_PROP TAB_FAVORITES   Not supported in version 1.0.

HHWIN_PROP_CHANGE_TITLE   Display the title of the selected
                    topic in the caption bar of the
                    help window.

HHWIN_PROP_NAV_ONLY_WIN   Display only the navigation and
                    toolbar panes, not the topic pane.

HHWIN_PROP_NO **TOOLBAR**   Don't show the **toolbar** pane.

(Figure 14. ILLUSTRATION OMITTED)

Although HHCTRL.OCX contains bitmaps for all the bitmaps shown in Figure 14, not all of them are supported in the code, as indicated. If you don't specify any **toolbar** buttons in the HH_WINTYPE structure, a default **toolbar** will be created with the Expand, Back, Options, and Print buttons.

There are a number of situations in which you might want to receive notification events from the help window: you might want to do something special when the user goes to a certain topic or when a certain **toolbar** button is pressed. The help window has the option of sending you notifications to tell you what the user does. Although full notification support was planned, only HHN_NAVCOMPLETE, described below, was finished in time for the release. Because an update to HTML Help will appear soon, I'll describe all the event notifications.

To receive notifications, you must set the idNotify field in HH_WINTYPE. Once set, you'll receive all kinds of notifications, but you can ignore those you're not interested in. Handling notifications is a matter of processing WM NOTIFY messages. The wParam parameter carries the value of the idNotify field you set in the HH_WINTYPE structure. It corresponds to the ID of the control sending the notify message (in this case the help window), so you can distinguish different senders from each other.

The lParam is a pointer to an HHN_NOTIFY structure, which looks like this:

```
typedef struct tagHHN_NOTIFY
{
 NMHDR   hdr;
 PCSTR   pszUrl;
} HHN_NOTIFY;
```

hdr contains a standard NMHDR structure, used in all Windows notification messages. pszUrl contains a string pointer used with HHN_NAVCOMPLETE notifications to indicate the URL the user switched to.

The NMHDR structure looks like this:

```
typedef struct tagNMHDR {
    HWND hwndFrom;
    UINT idFrom;
    UINT code;
} NMHDR;
```

hwndFrom is the handle of the Help window, idFrom is the notification ID you set with the idNotify field of the HH_WINTYPE structure. This same ID is also in the wParam parameter of the WM_NOTIFY message. The code field contains either the value HHN_NAVCOMPLETE or HHN_TRACK.

An HHN_NAVCOMPLETE notification message is sent after a new topic has been loaded. An HHN_TRACK notification is sent immediately when the user clicks a button. Figure 15 shows the code for handling notifications.

Figure 15 Handling Notifications
```
const int ID_MYHELPWINDOW = 100; // used in idNotify
// handles of the various windows created
HWND hwndHelp;      // the tri-pane window main frame
HWND hwndToolBar;    // top pane
HWND hwndNavigation;  // bottom-left pane
HWND hwndHTML;      // bottom-right pane
```

```
LPCTSTR windowTypeName = "MyWindow";
LPCTSTR windowCaption = "YourTravels Inc.";
const int ID_MYHELPWINDOW = 100; // used in idNotify
HH_WINTYPE winType = {
  sizeof(HH_WINTYPE), // cbStruct
  FALSE,              // fUniCodeStrings
  windowTypeName,     // pszType
  HHWIN_PARAM_PROPERTIES
  HHWIN_PARAM_TB_FLAGS,    // fsValidMembers
  HHWIN_PROP_TRI_PANE
// fsWinProperties
  HHWIN_PROP_TRACKING,
  windowCaption,      // pszCaption
  NULL,               // dwStyles
  NULL,               // dwExStyles
  {0},                // rcWindowPos
  0,                  // nShowState
  hwndHelp,           // hwndHelp
  m_hWnd,             // hwndCaller
  NULL,               // paInfoTypes
  // HHWIN_PROP_TRI_PANE stuff
  hwndToolBar,        // hwndToolBar
  hwndNavigation,     // hwndNavigation
  hwndHTML,           // hwndHTML
  0,                  // iNavwidth
  {0},                // rcHTML
  "file://c:/MyTopics/TableOfContents.hhc",  // pszToc
  "file://c:/MyTopics/Index.hhk",           // pszIndex
  "file://c:/MyTopics//Default.htm",        // pszHome
  HHWIN_BUTTON_EXPAND
// fsToolBarFlags
  HHWIN_BUTTON_BACK
  HHWIN_BUTTON_FORWARD
  HHWIN_BUTTON_STOP
  HHWIN_BUTTON_REFRESH
  HHWIN_BUTTON_HOME,
  0,                  // fNotExpanded
  0,                  // curNavType - - not supported in
                      // Version 1
  HHWIN_NAVTAB_TOP,   // tabpos
  ID_MYHELPWINDOW,    // idNotify
  {0},                // tabOrder {HH_MAX_TABS + 1}
  0,                  // cHistory - - not supported in
                      // Version 1
  NULL,   // pszJump1
  NULL,   // pszJump2
  NULL",  // pszUrlJump1
  NULL,   // pszUrlJump2
  {0}     // rcMinSize - - not supported in Version 1
};
```

```
// create the HelpWindow
void CHHTestDlg::OnButtonHtmlTest()
{
  HWND wnd = HtmlHelp(m_hWnd, NULL, HH_SET_WIN_TYPE, (DWORD)
   &winType);
  wnd = Htmlhelp(m_hWnd, "file://C:/MyTopics/
   TravelPackages.htm>MyWindow";
  HH_DISPLAY_TOPIC, NULL);
}
// Handle notifications from the Help window
BOOL CHHTestDlg::OnNotify(WPARAM wParam, LPARAM lParam,
 LRESULT(*) pResult)
{
/(*) This message uses the following structures:
    typedef struct tagHHN_NOTIFY
    {
     NMHDR   hdr;
     PCSTR   pszUrl;
    } HHN_NOTIFY;
    typedef struct tagNMHDE {
     HWND hwndFrom;
     UINT idFrom;
     UINT code;
    } NMHDR;
    type struct tagHHNTRACK
    {
     NMHDR   hdr;
     PCSTR   pszCurUrl;
     int     idAction;
    } HHNTRACK;
  (*)/
    If ( (wParam !=ID_MYHELPWINDOW
!lParam) )
      return CDialog::OnNotify(wParam, lParam, pResult);
    NMHDR(*) header = (NMHDR(*)) lParam;
    If (header->code = HHN_NAVCOMPLETE) {
      HHN_NOTIFY(*) helpNotification = (HHN_NOTIFY(*)) lParam
      char msg (200);
      sprintf(msg, "The user switched to page %s",
       helpNotification->pszUrl);
      MessageBox(msg);
    }
// these notifications aren't supported in Version 1
// of HTML Help
else if (header->code = HHN_TRACK) {
    HHNTRACK(*) trackHeader = (HHNTRACK(*)) lParam;
   char msg (200);
   sprintf(msg, "Button ID = %d, going to page %s",
    trackHeader->idAction, trackHeader->pszCurUrl);
   MessageBox(msg);
```

```
        }
        return CDialog::OnNotify(wParam, 1Param, pResult);
}
```

If you try this code with the current HtmlHelp API, you won't receive HHN_TRACK events. When the event is eventually supported, the idAction field of the HHNTRACK structure will contain the ID of the button that was pressed.

Search Support

HHW can automatically generate support for full-text search. The catch is you must use compiled HTML. You enable full-text search before compiling. In HHW, select the Project Tab, then click the Project Options button to get the dialog box. Check the "Compile full-text search information" check box, then compile the project. When you click the Compile button on the **toolbar** , the right pane of HHW shows the compilation progress, including a list of all the files compiled, the amount of compression achieved, and a few other statistics.

To view a compiled HTML file, click the View button on the **toolbar** . This opens a help window, but this time a Search tab appears next to the Contents tab. The tab displays a page that users can fill in to find specific words in the help system. The beauty of full-text search is that it doesn't require any work on your part. You just write your topic files, compile them with full-text search enabled, and go.

Training Cards

A training card is a window that helps the user accomplish a specific task. Training cards were first introduced with Windows 95, and have buttons that send WM_TCARD messages to the owner when clicked.

With HTML Help 1.0, you can't create training cards that act exactly as in WinHelp, but you aren't completely out of luck. You can use shortcuts to achieve a similar effect. To get shortcut buttons that look like their WinHelp counterparts--with the little arrow bitmap--create them with the HHW Shortcut Wizard. Select the "Create as a bitmap" option, and set the bitmap name to SHORTCUT.

The wizard also asks for the name of the program to invoke when the button is clicked. As an example, I chose a program called TellUs.Exe, which I wrote for the Your Travels system. What I got in my HTML file was the following entry:

```
<OBJECT id=hhctrl type="application/x-oleobject"
classid="clsid:adb880a6-d8ff-llcf-9377-00aa003b7all"
codebase="hhctrl,ocx#Version=4,71,1111,0"
        width=100
        height=100>
```

OBJECT >

The SHORTCUT image is a built-in bitmap. The file HHCTRL.DLL contains resources used by the HHCTRL ActiveX control, and one of them is the SHORTCUT bitmap. Incidentally, the DLL also contains the image list used with TOC entries and the **toolbar** button images shown in figure 5.

The HHW Wizard allows you to specify a message to send to the program

the button launches. If you specify WM_ TCARD, then your program will get WM_TCARD messages in a manner similar to WinHelp. The main difference is that this approach sends WM_TCARDs to your standalone program, while WinHelp training cards send WM_TCARDs to the owner window. I created a simple topic page that looks a lot like a WinHelp training card, with a shortcut button showing the SHORTCUT bitmap (see Figure 16).

     (Figure 16 ILLUSTRATION OMITTED)

     I created the TOC using HHW. The topic was created using plain old Word 97 and saved as an HTML file. Then I embedded the HHCTRL ActiveX control to support the shortcut button. For the window background color I used the value 0xFFFFFEF, which corresponds to the default Windows 95 training card color. The HTML code for the topic pane in Figure 16 is shown in figure 17.

     (Figure 16 & ILLUSTRATION OMITTED)

     Figure 17 Adding a Shortcut

     <

P>To turn PC Card sound effects
     on or off

1 Click here
```
<OBJECT  id=hhctrl type="application/x-oleobject"
     classid="clsid:adb880a6-d8ff- 11cf-9377-00aa003b7all"
     codebase="hhctrl,ocx#Version=4,71,1111,0"
     width=100
     height=100>
```

    OBJECT >
    to display PCMCIA properties,

2 On the Global Settings tab, click the check box to turn sound effects on or off,

- **If the PC Card (PCMCIA) wizard appears when you click the button in step 1, complete the wizard. After restarting your computer, double click the PC Card (PCMCIA) icon in the Control Panel, and then click the Global Settings tab.**

<

/FONT>

Converting an Existing WinHelp Project

There are many existing WinHelp projects out there, and a natural question is: "can I easily port my old projects to HTML Help?" In fact, HHW has a built-in wizard that can convert your WinHelp projects. The wizard essentially translates files from WinHelp to HTML Help formats. Figure 18 shows the files that are converted.

Figure 18 WinHelp File Conversion

File Description	WinHelp File Type	to HTML Help File Type
Project Files	.hpj	.hhp
Topic Files	.rtf	.htm
Image Files	.bmp and .wmf	.gif and .jpg
TOC Files	.cnt	.hhc

To take advantage of the new HTML Help features such as tri-pane windows, you'll need to roll up your sleeves and get your hands dirty because the conversion wizard doesn't create tri-pane windows. But even then, you won't get that dirty for most projects. The various wizards in HHW help you embed the HHCTRL ActiveX control to support shortcuts, TOCs, indexes, and other common features.

Conclusion

HTML Help is a major shift in concept for documentation systems, allowing the seam less integration of local and remote files. Moreover, because the system is based on HTML, you have the option of providing active content and using embedded ActiveX controls or Java applets. With remote links you can have users connect directly to your Web site for up-to-the-minute documentation. Users are no longer constrained to using the proprietary WinHelp engine to read the documentation--any standard Web browser can be used.

I've covered a lot of ground here, and I would need quite a bit more room to completely describe every feature in the new HTML Help system. But I hope I've given you a good idea of what's in the new product.

MICROSOFT DEVELOPER NETWORK ONLINE

For related information see: HTML Reference, http:// premium.microsoft.com/msdn/library/devprods/vintdev/htmlref/D1/ $43.htm. Also check http;//www.microsoft.com/msdn for daily updates on developer programs, resources and events.

Ted Faison has written extensively on Windows, Java, Delphi, and C++. He is president of Faison Computing Inc., a firm that develops software components and applications for Windows. Ted can be reached at ted.faison@computer.org.

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Special Features: table; program; illustration
Company Names: Microsoft Corp.--Products
Descriptors: Product Tips; Help File Generator
Product/Industry Names: 7372513 (Application Development Software)
SIC Codes: 7372 Prepackaged software
Ticker Symbols: MSFT

Trade Names: Microsoft HTML Help Workshop (Help file generator)--Usage
File Segment: CD File 275

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DIALOGWEB

Dynamic Search: Computers, Electronics, and Telecommunications
Records for: *toolbar*

save as alert...   save strategy only...

| Output | Format: Full Record | Destination: Browser | display / send |
| Modify | | refine search | back to picklist |

select
all | none

Records   37   of   154   In full Format

☐ 37. **3/9/37 (Item 37 from file: 275)**
02112297   **Supplier Number:** 19905084 **(This Is The** FULL TEXT **)**
Meeting on the Internet in 10 minutes. (Microsoft NetMeeting 2.0) (includes related articles on executive summary, standards, gatekeepers and gateways) (Software Review)(Evaluation)

Wong, William
Network , v12 , n12 , p131(4)
Nov , 1997
Document Type: Evaluation
Language: English   **Record Type:** Fulltext; Abstract
Word Count: 4142   **Line Count:** 00334

Abstract: Microsoft's NetMeeting 2.0 conferencing package adds H.323 videoconferencing to the data and audio conferencing capabilities in the first version and is interoperable with a variety of popular videoconferencing players operating over the **Internet** . Users can share documents via the Clipboard or transfer files and share applications in a similar fashion. NetMeeting is available as a free download from Microsoft's Web site. Client setup is very simple, with a Setup Wizard detecting video and audio hardware automatically and performing an input level test. Server installation is also easy. The client **interface** resembles **Internet** Explorer but has a tabbed window that provides an **interface** to Microsoft's **Internet** Information Server (IIS); only one IIS can be used at a time. NetMeeting is still missing some features found on telephone systems, such as an answering machine, but works well overall. Its support for H.323 does not include gatekeepers; bandwidth utilization can be controlled only through client-based restrictions.

Text:

```
NetMeeting 2.0 provides audio, video, and data conferencing. H.323 and
T.120 compliance means NetMeeting clients can conference with many other
systems.

NetMeeting Version 2.0 is an improvement over Microsoft's first attempt at
a network conferencing package.
     Version 2.0 includes data and audio conferencing and adds H.323 video
con- ferencing support. NetMeeting also follows the T.120 computer
conferencing series of standards (see "Standards Fever," page 133), which
allows inter- operability with other video conferencing players such as
Intel, PictureTel, VTel, and VDOnet.
     NetMeeting has several document-conferencing features. Once you have
established a connection with your meeting partner, you can share
information via a shared clipboard, or you can transfer files. NetMeeting
```

also lets you share applications in the same fashion as a remote control program. For more free-form work, you can use the shared whiteboard. Each participant can draw or make annotations on the whiteboard.

Several people can participate in a data conference, but audio or video con- ferencing is strictly person-to-person. (You could, however, set up several two-person audio or video conferences and switch among them.)

GEARING UP

The NetMeeting software is a free download, available at Microsoft's **Internet** site (www.microsoft.com). NetMeeting consists of the NetMeeting client and the **Internet** Locator Server (ILS; more about ILS in a moment). The NetMeeting client runs on Microsoft's 32-bit operating systems-Windows 95 or Windows NT. (A Windows 3.x version is not in the works.) In terms of hardware requirements for NetMeeting clients, a Pentium processor is only the starting point, and the latest video-capture hardware coupled with a camera is the best way to take advantage of NetMeeting.

Hardware choices for audio and video conferencing can affect how well these conferences will work. Sound cards support half- or full-duplex audio. Older 8-bit and 16-bit audio cards are typically half-duplex, which means you can talk or listen, but not both at the same time. Newer plug-and-play sound cards offer full-duplex and sometimes echo canceling support; the latter is useful for speakerphone-style operation.

If you have an **Internet** connection and plan to be making all your NetMeeting calls across this connection, all you need is the NetMeeting client. If you plan to use NetMeeting on your LAN, you might want to set up an ILS. Other- wise, you can get by with just NetMeeting on each client, as long as you popu- late your own address book with the necessary network addresses.

What if you don't know the address of someone you want to call, or what if that person has a dynamically assigned IP address (which is likely to be dif- ferent each time he or she logs in)? The solution for these problems is the **Internet** Locator Service, which can be thought of as a directory service for NetMeeting clients. ILS runs on a Windows NT Server and works in conjunction with Microsoft's Web server, **Internet** Information Server (IIS). NetMeeting clients use the Lightweight Directory Access Protocol (LDAP) to communicate with the ILS. You can configure a NetMeeting client with the name and address of a default ILS, and when a user starts up the NetMeeting client, it will automatically link up with the designated ILS and register the IP address.

In addition to LDAP, ILS uses IIS Active Server Pages to provide a scripting **interface** that allows Web pages to be created for adding users and displaying groups based on programmed criteria.

Anyone can call you when you have NetMeeting, simply by using the same ILS. Numerous ILSs can be found on the **Internet** .

INSTALLATION

NetMeeting client setup is simple. The Setup Wizard detects audio and video hardware and performs an audio input level test during the installation pro- cess. You can enter the address for a default ILS. The standard client installation provides support for modem and network connections. The latter supports IP- and IPX-based networks. Document conferencing (application shar- ing, chat, and file transfers) can be done across modem links or IPX LAN con- nections, but audio and video conferences require IP.

ILS installation is simple, but it does not address customization of the ILS, which must be done after it is installed. The basic ILS support lets users automatically register themselves in the ILS database by simply connecting via a NetMeeting client. ILS documentation covers additional scripting options, but their implementation can be complex and time-consuming, depending on the level of customization. For a small number of client installations, basic ILS and NetMeeting client installation can be done in an hour.

USING NETMEETING

The NetMeeting client looks a lot like Microsoft's **Internet** Explorer, but Net- Meeting's tabbed window is where it differs. The Directory tab provides an **interface** to an ILS. Unfortunately, only one

ILS can be used at a time, but you can quickly change between multiple ILSs.

An ILS is not the only way to make a connection. HTML links of the form callto: address allow links via IP address, domain name, and even an e-mail address. The latter uses an ILS to resolve the address. This type of linkage can be used for applications like help desk support.

The SpeedDial tab lets you quickly call back recent callers. The Current Call tab shows who is involved in an active call, and shows video images for video conference calls. A History window contains a list of recent calls.

NetMeeting operation is relatively simple. You use entries in the Directory or SpeedDial pages, or click on the Call button on the **toolbar** .

You can configure NetMeeting so that incoming calls pop up a dialog box identifying the caller, letting you decide whether to take the call. Alternatively, you can set NetMeeting into auto-answer mode. You can also set up a multiuser conference call, which is hosted by one NetMeeting workstation. Participants call the host to join a conference. Participants can join or exit a conference as long as it is being hosted.

Once a conference is active, the participants can use the chat, shared clip- board, whiteboard, file transfer, and application-sharing features. Chat is text-oriented; it's implemented with a window, where you type and see what others type. Usually, what you type is seen by all participants, but you can send messages selectively-a process called whispering. You can also save the contents of the chat session. The shared clipboard lets you copy information from a local application and have someone paste it into a remote application. This is especially handy with the application-sharing feature. Application sharing lets you see an application running on a remote PC. With NetMeeting you can control a remote application and paste information that you copied to the clipboard onto your local PC.

Like most remote control programs, NetMeeting's shared application support attempts to limit the amount of information sent to update remote screens. Information is cached at the remote site so items used repeatedly can be used without resending their entire contents. A technique called smart spoiling tracks screen updates. If information in the outgoing queue will be over- written by newer information being added to the queue, then NetMeeting will toss out the older information.

Still, like any remote control program, there is a delay between what occurs on the host PC and what is seen on the remote clients. Applications that per- form complex screen updates (like CAD programs) might operate more slowly because of the amount of information being sent to remote clients.

The whiteboard is a multiple-page drawing pad. It supports drawing objects and text using any available fonts. You can even use highlighters. It is possible to create presentations and present them during a conference, allowing participants to annotate your work.

How well application sharing and whiteboarding perform depends on the number of participants in a call. NetMeeting does not support multicast IP, so information must be sent to all participants individually. Non-audio and -video conference operations use varying amounts of network bandwidth based on the kinds of operations being performed. For example, pasting bitmap graphics into the whiteboard uses more bandwidth than drawing a circle; this is because the whiteboard is **object** -oriented, not bitmap-oriented.

File transfer lets you send and receive files without having to give others direct access to your local disks. You set up an incoming folder to accept files, and you can selectively send files to individual people.

In previous Test Drives, I've looked at Intel's ProShare Video System 200 and Picture Tel's LiveLAN (see the February 1996 and November 1996 issues of LAN Magazine, respectively). Those products, when communicating with their own clients, showed video quality somewhat superior to NetMeeting's. However, I've found that all of the H.323-compatible systems I've tested to be roughly on par with one another. This also applies to the aforementioned Intel and Pic- tureTel products when they were placing calls to other H.323-compatible sys- tems.

The International Telecommunications Union's (ITU's) Common Intermediate Form (CIF) defines video quality. NetMeeting 2.0 supports Full

CIF (FCIF), which has a resolution of 288-pixels-by-352-pixels, and Quarter CIF (QCIF) which has a resolution of 144-pixels-by-176-pixels. (The video windows shown in the fig- ure are QCIF.)

Typical LAN throughput for NetMeeting video conferencing is 493Kbits/sec (with FCIF), which is well above a modem's 28.8Kbits/sec or 33.6Kbits/sec.

WHAT'S MISSING

NetMeeting lacks many features found on telephone systems. An answering machine-like feature would be handy for times when you're away from your desk, and for handling calls while you're hosting a closed conference. It would also be nice to have call waiting, call forwarding, and a rotary system to dis- tribute incoming calls to different workstations.

Chat mode is handy, but all parties must activate chat mode to use it. There is no way to use Chat to send a simple message like "Turn on Chat." NetMeeting also lacks other useful features found in competing products, like the auto- matic business card exchange found in Intel's ProShare.

While this version of NetMeeting does adhere to the standards, it does not implement all possible features. For example, it does not support H.323 gatekeepers (see "Gatekeepers and Gateways", page 134). H.323 gatekeeper sup- port may be a prerequisite for use in many networks requiring strict bandwidth control. Many competing products such as PictureTel's LiveLAN 3.0 work with gatekeepers.

LAN CONSIDERATIONS

Because NetMeeting does not work with H.323 gatekeepers, client-based restric- tions are used as an alternate way to limit bandwidth utilization. Keeping your clients "friendly" (making sure they're not using too much bandwidth) will be an important task. Otherwise, too many NetMeeting conferences could bring your network to its knees.

With a gatekeeper, NetMeeting clients would have to contact a gatekeeper to start a call. If too much bandwidth was in use by other conferences, your call could be rejected (equivalent to placing a telephone call and getting the recorded message "all circuits are busy"). No user wants to have his or her call rejected, but this approach does ensure that network utilization stays within limits.

With client-based restrictions, each client sets fixed limits on its use of the network. On a LAN, the network throughput is usually much larger than that used by a single connection, but multiple connections may be in use, so in the aggregate they could still exceed the network maximum. Reducing the quality, and hence the bandwidth, of audio or video conferences reduces overall network utilization-if all connections abide by the restrictions. This also assumes that the number of simultaneous connections does not rise significantly, which could occur after a successful, limited trial installation of NetMeeting.

You can also limit the kinds of services available for a connection. For exam- ple, you may allow audio conferences but not video conferences. Voluntary limitations are fine, but the Windows 95 and Windows NT system policy settings can be used as well. The policy settings can be read from a Windows NT Server when a user logs on to the workstation, but this feature must be installed on Windows 95 prior to its use. (System policy support is not installed by default under Windows 95.) Many networks may already use the policy settings because they can limit access to other aspects of Windows-such as the ability to change video or network settings.

NetMeeting comes with a system policy administration template file. Open this file from the policy editor program, then open the registry or a system policy file. You can adjust as many NetMeeting settings as necessary, make life easier for users by presetting the ILS name or IP address, prevent users from making changes to the system settings, and eliminate bandwidth-hungry features like video conferencing. Windows system policies can be set globally for groups or for individual users. You can allow changes by administrative users.

Use of an H.323 gatekeeper will not eliminate the need for the system policy settings. The gatekeeper can provide other services, such as tracking calls, but the system policies are the only way to enforce other NetMeeting restric- tions, such as allowing changes to various NetMeeting

settings.

Today's hub-based 10BaseT and 10Base2 networks can handle multiple data con- ferences and half a dozen audio or video conferences, assuming the current network is not heavily loaded with other traffic. Switch-based networks are a good investment if the number of audio and video conferences is greater than this amount. Fast Ethernet hubs, Fast Ethernet switches, and ATM-based networks can also handle NetMeeting conferences without significantly impact- ing normal network operation.

Firewall settings are a consideration for network-to-**Internet** connections. The NetMeeting Resource Kit addresses the details of this for Microsoft products like the Microsoft Proxy Server, and much of this information also applies to third-party firewall and proxy server products. The documentation notes that some firewalls can handle any number of outgoing calls but only a restricted number of incoming calls. NetMeeting uses UDP for IP connections needed for **Internet** calls, which may be a concern for firewall configuration.

DEVELOPERS

The NetMeeting Sofware Development Kit is available on Microsoft's Web site. It includes an ActiveX control that can add conference support to Web pages. It supports JavaScript and Visual Basic Scripts as well as other OLE-enabled applications. COM (Common **Object** Model) objects are provided for ILS support, **custom** audio and video codec installation support, and for adding NetMeeting support to COM-based applications. Sample files are included, but the develop- ment tools are not for most users.

Most Webmasters will add basic call linkages to Web pages using the callto statement. You will need the ability to access HTML tags (which typically means working directly with the HTML source file), so you can add a callto statement. Users that have NetMeeting installed can then click on callto hyperlinks to initiate a conference call.

MEETING TIME

NetMeeting Version 2.0 will have a major impact on data, audio, and video con- ferencing. Hopefully, we will continue to see improvements in it and other vendors' solutions while maintaining compatibility. NetMeeting is adding to the validity of audio and video conferencing in the workplace simply through the weight of Microsoft's commitment.

The next major release of NetMeeting is supposed to bring much-needed features like H.323 gatekeeper support. In the meantime, NetMeeting may be just the computer conferencing tool you need, if your network has the bandwidth to spare. Audio conferencing hardware (a sound board) is now part of almost every new PC, so all you need beyond this is a microphone. Video conferencing hardware is available for less than $1,000, with some solutions closing in on the $100 price tag. Best of all, computer conferencing solutions can be used to get real work done.

Executive Summary
NetMeeting 2.0
Microsoft
One Microsoft Way
Redmond, WA 98052
(206) 882-8080
(800) 936-4400
. www.microsoft.com
Price: Free; downloadable from Microsoft's Web site.
Requirements: A 90MHz Pentium-based computer or better, running Windows 95 or Windows NT 4.0, with 5Mbytes of available hard disk space. For Windows 95, 16Mbytes of RAM is required; for Windows NT, 24Mbytes of RAM is required. Using the video conferencing features requires a video camera and video-capture card that supports Video for Windows drivers; for audio con- ferencing, a sound card, speakers, and microphone are required. **Internet** Locator Server (ILS) runs on a Windows NT Server 4.0 machine with 32Mbytes of RAM and 8Mbytes of available hard disk space.

NetMeeting is Microsoft's network conferencing solution-including audio and video conferencing. It's compliant with the ITU's H.323 standard for video conferencing. Conferees can communicate across the **Internet** or TCP/IP-based intranets. IPX/SPX links and point-to-point modem links are

also supported-but only for document conferencing. NetMeeting 2.0 is a good basic solution for conferencing.

Installation: Installing NetMeeting's client was easy. I only needed to run through a voice test and enter the ILS's name. ILS installation was just as easy. The online HTML-based documentation is combined with Java scripts to test the ILS.

Documentation: Good. Online documentation can be viewed via a Web **browser** , and document files (containing the same information) are provided. The NetMeeting Resource Kit is very useful, covering troubleshooting, firewall setup, and proxy server setup.

Warranty: Ninety days on media.

Technical support: Fair. Microsoft provides free installation support for 90 days. Various fee-based support plans are available. **Internet** service is free, including access to the latest software updates.

Ease of use: Very good. The NetMeeting client is easy to run. Calls via an ILS are simple to make, and Web pages can be customized for call initiation. The whiteboard is **object** -oriented, and application sharing provides remote control support.

Robustness/compatibility: NetMeeting workstations easily connect to other Net- Meeting workstations and communicate with third-party H.323-based products. Only Windows NT and Windows 95 clients are supported, but Microsoft has announced an alliance with Farallon Communications, whereby Farallon will develop a NetMeeting-compatible data conferencing package for Macintosh clients.

Applicability: NetMeeting provides data, application sharing, and audio and video conferencing over a network, including the **Internet** . Its lack of H.323 gatekeeper support will limit large-scale corporate use, but it works well when the number of NetMeeting conference calls is limited. Gatekeeper support is less of an issue for switch-based networks with plenty of available band- width.

Test environment: Micron 166MHz Pentium with 32Mbytes of RAM and a 2Gbyte hard disk, running Windows NT Server 4.0. The machine was connected to an Ethernet LAN via a 3Com LinkSwitch 1000. A 90MHz Pentium workstation with 16Mbytes of RAM and Winnov video conferencing hardware. A Pentium II workstation with 16Mbytes RAM and PictureTel LiveLAN 3.0 video conferencing hardware.

WHAT DOES IT ALL MEAN?

Standards Fever

Standards fever has people spouting letters and numbers that mean nothing to the uninitiated computer user. It is possible to understand a little of the jargon without getting too deep into the underlying details. There are a group of standards that are used for computer conferencing.

There are standards for video and audio codecs (coder/decoders used to trans- form analog audio and video signals into compressed digital bit-streams, and back again). There are standards that incorporate these for holding a com- puter-based conference. In many instances, the standards are also a mix-and-match collection of other standards. Luckily, there are only a few that you really need to know about, which include those from the International Telecommunications Union (ITU).

First, there are the general video conferencing standards: H.320, H.323, and H.324. H.320 is a video conferencing standard using ISDN connections. H.323 and H.324 are similar, but H.323 works over a network, like the **Internet** , and H.324 works with modems.

There is also the T.120 series, which defines a document conferencing architecture. Multiple T.120 standards exist, covering everything from Generic Conference Control (T.124) to Multipoint File Transfers (T.127). The T.128 standard, supported by NetMeeting, allows control of remote applications, just like services provided by remote control programs. What you need to know when considering conferencing packages is whether their features are implemented using the standards and what the features are, such as remote application con- trol. In theory, standards should ensure that hardware and software from dif- ferent sources work together.

MANAGING AND FACILITATING CONFERENCES

Gatekeepers and Gateways

NetMeeting is not currently compatible with H.323 gatekeepers.

However, this will change in the future, so it is important that you consider them, as well as gateways, when planning NetMeeting installations.

An H.323 gatekeeper is a server that manages bandwidth and conferences. Many incorporate LDAP (Lightweight Directory Access Protocol) and ILS (**Internet** Locator Server) support, as well, but a gatekeeper is not just a directory service. NetMeeting's optional client-level bandwidth controls are one way to limit a conference's load on a network. This is handy for throttling **Internet** connections, but it does not prevent overloads on intranets where many con- ferences are likely to occur.

The addition of a gatekeeper means that H.323 clients place conference calls via the gatekeeper. The gatekeeper is involved in the initial call setup and call completion, and the gatekeeper can reject a call if the current number of calls or their load on the network exceeds the configured threshold. Con- ference call loads are based primarily on audio or video conferencing that uses a fixed bandwidth, making tracking relatively easy for the gatekeeper. All the gatekeeper needs to do is add the bandwidth to what's currently in use when a connection is made, and remove it when the connection is terminated. This is actually the simplest case with point-to-point conferences over a network that has a fixed bandwidth, such as a 10BaseT Ethernet network imple- mented with hubs. The equation becomes more complicated when switching networks, as well as WAN links, are involved. In this case, the gatekeeper must be programmed with the network topology as well as with the location of workstations.

H.323 gateways are servers used to bridge the gap between H.323 clients and other conferencing protocols, such as the ISDN-based H.320 and the modem-based H.324 point-to-point protocols. Gateways can also provide connections to proprietary conference clients. A gateway could even provide audio conferenc- ing for voice calls over a telephone. For example, some conference participants might be using a room-based conferencing system, others might be using workstation-based systems, and some might be using conventional telephones.

Unlike the H.323 gatekeeper, the H.323 gateway is actively involved throughout a conference-not just for the initiation and termination. Information passes through the gateway between the clients. Conferences that operate through a gateway are bandwidth-limited by the slowest part of the connection. Like a gatekeeper, a gateway can also limit the number of calls and the bandwidth used for each call.

Gatekeepers and gateways are key features needed for widespread use of com- puter conferencing on any type on a network. They provide the control and the connections necessary for general use. Without them, the network manager can- not manage the bandwidth utilization on the network or provide links to the outside world.

Eventually, gatekeepers and gateways will be as common as file, print, and application servers. Conferences between clients on different networks will be common, and audio and video conferencing will finally be a standard method of communication that is also integrated with the telephone system. That time is not too far away.

William Wong is a computer consultant and writer. He can be reached at bwong@voicenet.com.

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Special Features: other; illustration
Company Names: Microsoft Corp.--Products
Descriptors: Videoconferencing Software; Software Single Product Review
Product/Industry Names: 7372674 (Videoconferencing Software)
SIC Codes: 7372 Prepackaged software
Ticker Symbols: MSFT

Trade Names: Microsoft NetMeeting 2.0 (Videoconferencing software)--Evaluation
File Segment: CD File 275

DIALOGWEB.

Guided Search | new search | favorites | settings | cost | logoff | help

Dynamic Search: Computers, Electronics, and Telecommunications

Records for: *toolbar*

save as alert... | save strategy only...

Output | Format Full Record ▼ Destination Browser ▼ | display / send

Modify | refine search | back to picklist

select all none

Records 53 of 154 In full Format

☐ 53. **3/9/53 (Item 53 from file: 275)**
02047314 **Supplier Number:** 19183862 **(This Is The** FULL TEXT **)**
Extend client/server apps to the Web.(Visual Components' WebViewer and Powersoft's Internet Development Toolkit) (Product Information)

Evans, Nick
Data Based Advisor , v15 , n3 , p52(5)
March , 1997
ISSN: 0740-5200
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Word Count: 2346   **Line Count:** 00225

Abstract: Visual Components' $249 WebViewer and Powersoft's $99 **Internet** Development Toolkit give developers the tools to Web-enable existing applications. The Powersoft package can be used to create dynamic Web server applications, or to Web-enable existing PowerBuilder applications. WebViewer lets developers add a Web **browser** to an application with an ActiveX control. The advantage of using the WebViewer control instead of a standard HTML **browser** , is that the WebViewer **browser** can be more closely integrated with the application, and is more readily **customizable** . WebViewer is not as full-featured as commercial browsers, but does present a simple way to Web-enable a Windows application. The Powersoft product is best suited to intranet development, since some software must be installed on the **browser** system.

Text:

Powersoft offers several **Internet** -enabling technologies that can help you get to the Web-- whether you already use PowerBuilder, or are looking for a new tool to start developing Web applications.

If you're like most information professionals, you're thinking about how to start creating applications for the Web--or you're already there. Maybe your environment of choice has an easy way to get to the **Internet** , and you're going with that. Or maybe you're trying to decide which tool will help you get started on the Web most easily.
    There are many products that help create Web applications, and some that let you Web-enable existing applications. Because the **Internet** is really just an extension of the client-server model, a client-server tool is a great choice for developing business applications for the **Internet** . Many client-server giants have released **Internet** -enabling solutions over the past few months, including Oracle, Centura (formerly Gupta), and Powersoft. In this article, I take a look at the tools from Powersoft, review these enabling technologies, and explore ways you can use

PowerBuilder to extend your applications to the **Internet** .
    These tools are the **Internet** Developer Toolkit and the WebViewer
from Visual Components. You can use the **Internet** Developer Toolkit (IDT)
to build dynamic web server applications, or extend existing PowerBuilder
applications to the Web. WebViewer lets you add a web **browser** to your
applications using a simple ActiveX control that can be highly customized
through its properties, methods, and events. Although the IDT is
PowerBuilder-specific, you can use WebViewer in any Windows application.
    Go-anywhere **browser**
    WebViewer is an HTML **browser** that's implemented as a 16- and 32-bit
ActiveX control. This control can be used to integrate an HTML **browser**
into any Windows application. The **browser** can be added with just a few
mouse clicks, and demonstrates component-based application development at
its best. It's ideal if you want a customized **browser** that can take users
out to specific parts of the **Internet** for the latest information online.
    The advantages of using this control over a standard HTML **browser** ,
such as Navigator or Explorer, are that you can more tightly integrate the
browser with your application, and **customize** the behavior of the
browser through the control's properties, methods, and events Figure 1
shows the WebViewer control within a PowerBuilder Window.
    (Figure 1 ILLUSTRATION OMITTED)
    The control includes a **toolbar** with nine default buttons for the .
most commonly used functions within the **browser** . These functions are:
Home Page--Jumps to the home page specified by the HomePage property.
    Open File--Displays an Open dialog that lets the user load an existing
file.
    History--Shows a page that contains a history list of the pages the
user last visited.
    Source--Displays the HTML source code of the current page.
    Save--Lets the user save the current page to disk.
    Previous--Jumps to the previous page.
    Next--Jumps to the next page.
    Reload--Reloads the current page or, if a page is being loaded, aborts
the loading of the current page.
    URL--Displays an Open URL dialog that allows the user to enter a URL
address and open a new page on the Web.
    While WebViewer doesn't have the same level of functionality as
commercial browsers, it offers a simple and cost-effective solution for
web-enabling Windows applications. It really comes into a league of its own
when you start to **customize** the **browser** for your application. For
example, by taking advantage of the control's properties, methods, and
events, you can restrict users to certain URLs, set the default home page,
and more.
    Internet Developer Toolkit
    As its name suggests, the **Internet** Developer Toolkit contains many
tools that are useful for your **Internet** development. The products
included in the toolkit are:
    * Window and DataWindow Plug-Ins.
    * Web.PB.
    * Web.PB Class Library.
    * Web.PB Wizard.
    * O'Reilly's WebSite web server.
    * Code examples and documentation.
    The PowerBuilder Window and DataWindow Plug-Ins are extensions to the
browser environment, and allow third-party applications to run within the
browser itself. The DataWindow Plug-In lets you display a Powersoft
Report (.PSR) file within your **browser** . A.PSR file is a snapshot of a
DataWindow, and contains a presentation style and data. This file can be
created by InfoMaker (Powersoft's reporting tool) or PowerBuilder. A
DataWindow Plug-In is a great way to display charts and graphs within the
browser environment, as shown in figure 2.
    (Figure 2 ILLUSTRATION OMITTED)
    The HTML necessary to display a .PSR is:

Bank Web - Statements

Bank Web now offers online access to your Bank
Statements.

Please select the account and statement period
that you would like to view.

| |Checking
◯ Savings

Month | January | ▼ |

Year | 1996 | ▼ |

Submit

Reset

Back to the Home Page

After the user **object** method is invoked within the DPB server
application, you're free to build your own dynamic HTML and return it back
to the **browser** . The code below shows how you retrieve data from the
database into a DataStore. The contents of the DataStore are converted to
HTML using the HTMLTable property, and included in the HTML string that's
returned to the **browser** :
DataStore ds_datastore
Integer ai_month
Long 11_rowcount
String 1s_rtn, rc_header, rc_footer, 1s_cust_id

rc header = " " + &
"" + &
"

Bank Web - Bank Statement

```
                              "

              rc_footer = "


            Back to the " + &
                    ` "
                    _

        startupfile = "bankweb.ini."

    /* Populate sqlca from the BANKWEB.INI settings */
    sqlca.DBMS       = ProfileString (startupfile, &
              "database", "dbms", " ")
    sqlca.database   = ProfileString (startupfile, &
              "database", "database", " ")
    sqlca.userid     = ProfileString (startupfile, &
              "database", "userid", " ")
    sqlca.dbpass     = ProfileString (startupfile, &
              "database", "dbpass", " ")
    sqlca.logid      = ProfileString (startupfile, &
              "database", "logid", " ")
    sqlca.logpass    = ProfileString (startupfile, &
              "database., "LogPassWord", " ")
    sqlca.servername = ProfileString (startupfile, &
              "database", "servername", " ")
    sqlca.dbparm     = ProfileString (startupfile, &
              "database", "dbparm", " ")

              CONNECT;

        // Create the datastore
    ds   datastore = Create DataStore

        // Assign the datawindow object
    ds datastore.DataObject = "d account balance gr"

        // Set the transaction object
    ds   datastore.SetTransObject (SQLCA)

          CHOOSE CASE as month
            CASE "January"
            ai month = 1
            CASE "February"
            ai month = 2
                ..
            CASE "December"
            ai month = 12
            END CHOOSE

        // Retrieve the bank statement
    11 rowcount = de datastore.R.triev.(1s cust id, &
          ai month, Integer(as year))
        IF 11 rowcount = -1 THEN
        1s rtn = "Database error"
        ELSEIF 11 rowcount = 0 THEN
    1s rtn = "No data was found for this " + &
        "month and year. Please try again."
            rc footer = "


            Back to the " + &
                  .
```

```
                        ELSE
                  ls rtn = &
        ds datsatore.ObJect .DataWindow.Data.HTMBTable
        rc header = rc header + n Here's your " + &
              as account type + " balance for " + &
              as month + ", " + as year + ""
                        END IF

              // Destroy the datastore
              Destroy ds datastore

        ls rtn = rc header + ls rtn + rc footer
                  Return ls rtn
```

Figure 6 shows the end result. The HTML page displayed here was created dynamically and contains data that came straight from the database.
(Figure 6 ILLUSTRATION OMITTED)
Along the way
The Web.PB Class Wizard helps you build the HTML forms to access DPB methods. Through a series of screens, it captures all the information it needs to produce your HTML code for you. Another useful tool in the IDT is the Web.PB Class Library, which includes these services to assist with your development:
* HTML Forms Processing Service.
* HTML Generation Service.
* HTML Template Service.
* Session Management Service.
* Transaction Management Service.
These services are user objects that contain a large number of methods for a variety of uses. For example, the Session Management Service lets you keep track of particular users as they move from one page to the next in your Web.PB application. The HTML Generation Service builds HTML tags when you're creating dynamic HTML to be returned to the **browser** . The HTML Forms Processing Service builds HTML FORM elements, including elements populated from the data contained in PowerBuilder DataStores.
Web.PB requires only an HTML **browser** on the client. This makes it a great choice for any **Internet** development where you can't predict or change the configuration of the client machine, as you can with Intranet clients.
Conclusion
As mentioned, the advantages of the Powersoft solutions include use of a proven technology, shorter time to market, and investment protection. The solutions also include multiplatform support, database independence, **browser** and web server independence, and support for industry standards such as Java, ActiveX, and Plug-Ins.
The new enabling technologies of Web.PB and the Window and DataWindow Plug-Ins are just the beginning of Powersoft's offerings for Web development. We'll soon see their NetImpact Studio product, which is a complete development environment for creating web applications. With all the new products coming out for web development, it's an exciting time to be a developer. The challenge is to keep up-to-date!
Nick Evans is a senior associate with Coopers & Lybrand Consulting in Dallas, Texas, and specializes in client- server and **Internet** consulting for Fortune 500 clients. He's a Certified PowerBuilder Developer and Microsoft Certified Professional, and writes for several computer industry magazines. Nick is the author of an upcoming book from Powersoft Press on **Internet** application development using PowerBuilder 5.0. (972)448-5104, 102604.3142@compuserve.com.

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Special Features: illustration; program

Company Names: Visual Components Inc.--Products; Powersoft Corp.--Products
Descriptors: Product Description/Specification; **Internet** /Web Server Software
SIC Codes: 7372 Prepackaged software
Ticker Symbols: PWRS
Trade Names: WebViewer (**Internet** /Web server software)--Usage; **Internet** Developer Toolkit (**Internet** /Web server software)--Usage
File Segment: CD File 275

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DIALOGWEB.
Guided Search

new search | favorites | settings | cost | logoff | help

✿ Dynamic Search: Computers, Electronics, and Telecommunications

▤ Records for: *toolbar*

save as alert...   save strategy only...

| Output | Format: Full Record ▾ | Destination: Browser ▾ | display/send |
| Modify | | refine search | back to picklist |

select
all none   **Records 41 of 154 In full Format**

☐ 41. **3/9/41 (Item 41 from file: 275)**
02091767   **Supplier Number: 19660297 (This Is The FULL TEXT)**
Add control to your intranet. (Mortice Kern Systems' Web Integrity 2.1 Web site development management tool software) (Software Review)(Evaluation)

Finn, Mike
Databased Web Advisor , v15 , n8 , p56(3)
August , 1997
Document Type: Evaluation
ISSN: 1090-6436
Language: English   **Record Type:** Fulltext; Abstract
Word Count: 1196   **Line Count:** 00098

Abstract: Mortice Kern Systems' Web Integrity 2.1 is an excellent Web development management tool set, especially for implementing version control and configuration management. It provides management facilities for multiple author contributions and collaboration, change management, and helps to implement a process-driven development/release cycle. The product consists of a client and a server module. The server module works with Netscape's and Microsoft's Web servers. Objects are registered with Web Integrity's server, which keeps a repository of changes on the Web server. The Windows-based Web Integrity client configures the Web **browser** to use Web Integrity's proxy server. Pages to be "checked-out" for editing will present a **toolbar** at the top of the page. When the Edit button is clicked it puts a lock on the page to prevent other users from making changes at the same time.

Text:

```
 Bring version control and configuration management to your web sites with
MKS Web Integrity.

Web Integrity is a set of tools to manage your web site development
projects. It provides change management, a means to manage multiple author
contributions and collaboration, and helps your organization move toward a
process-driven development/release cycle for web content. It's the latest
from MKS, the folks who brought you Source Integrity, a commonly used SCM
tool for client-server project management.
        Architecture and security
     MKS Web Integrity is composed of two parts: the server and the
client. The server portion works with your Netscape or Microsoft web server
to provide repository and version-control facilities for that server's
content. The Web Integrity server keeps a repository (on the web server) of
all changes made to an object since it was registered. Objects are
```

explicitly registered through the Web Integrity client tool by those users with appropriate access.

The Web Integrity server uses the security mechanisms provided by your web server, so you can control group and user-level read and/or write access to certain functions and objects. If you use a Netscape server, Web Integrity installs two **custom** Access Control List (ACL) styles: one for the CGI-based tools and report utility, and one for the document file tree on the web server. If you have the Microsoft Server (2.0 or later), you assume the security provided with NT File System (NTFS).

The toolset

Several tools are available to manage the source code in your client-server projects with varying levels of control, but very few tools can manage your web site content with more than the traditional file-based approach. Web Integrity provides a Web-centric approach to web site management and development. Its Java-based user **interface** exists completely within your **browser** .

Web Integrity provides a set of tools and utilities common to its traditional Software Configuration Management (SCM) brethren. Visual differencing, change history, version rollback, and strict **object** locking are just a few. After Web Integrity is installed on your server, every **object** stored on that server can be controlled by the Integrity Engine. Objects managed by Web Integrity include HTML files, Java applets, audio and text files, and graphics.

Web Integrity uses a patent-pending publishing model MKS calls Surf Edit Approve (S.E.A.) cycle. S.E.A. is a three-step, **browser** -contained process to publish changes to a web **object** , from Web Integrity's web-based user **interface** . The three steps are "Surf" to the **object** you want to change, "Edit" the **object** , and "Approve" and publish the **object** to the web server. These three steps are described later in detail. Throughout a S.E.A. cycle, the Web Integrity server keeps track of who is making the changes.

The Web Integrity environment

When you invoke the Web Integrity client from Windows, the software configures your **browser** to use the Web Integrity proxy server, which inserts itself between your **browser** and server. After the **browser** is running, you're ready to load a page from your Web Integrity-controlled server. This is where the S.E.A. cycle comes into play.

To "check out" a page for change, simply Surf to the page (it must be on a server where Web Integrity server is installed), and you'll see the **toolbar** at the top of the page (figure 1). The Edit button of the **toolbar** places a lock at the server (so other users can't make changes while you're editing), then places a copy of the **object** to your draft area and launches your preferred editor for that **object** type. (This is configurable from the Settings button on the **toolbar** .)

You can also select components from your page, such as images, sound files, etc., for editing. To edit a component, simply click on the Components button. A list of components referenced by the current page will be shown (figure 2). A click on the component launches the preferred editor.

Your working copy of the objects being edited remains in your draft area. During your edit cycle, you can preview the site as if the objects in your draft area were published, via the Preview button.

When you're done editing, you will automatically "Approve" the **object** for submission to the web server When you press the Submit button, you're prompted to enter a description of the changes you've made, before publishing the **object** to the server. At this point, you can also compare the differences between what you are going to submit and what is currently on the server, discard the changes you've made, or return to the editor.

When you're ready to submit the **object** , Web Integrity places the page on the server and records the change in the change log for that **object** . History is recorded in the server repository (figure 3), where you can restore previous versions of your web pages.

Other Web Integrity tools include:

Delete Tool--Lets you delete a version from a page's history.

State and Label Tools--Let you assign labels and states to a page.
Reporting Tool--Does reports for page history, currently locked pages, recently changed and unchanged pages, and **customizable** reports.
Installation and setup
The Web Integrity software CD includes both client and server. The server portion supports Netscape Fast Track and Enterprise and Microsoft IIS web servers. The client side runs under any HTML 2.0 compatible **browser** , such as Netscape Navigator or Microsoft **Internet** Explorer. The server portion installs on your web server and does some basic configuration to enable your server to recognize its CGI-based tools. Once installed, you need to do some further configuration to set up the security controls appropriate for your server. Along with the server software, Web Integrity documentation is installed, including the User Guide and Tutorial.
Documentation
Web Integrity ships with HTML-based user documentation and tutorial that's automatically copied to your hard drive by the installation program. A hardcopy reference guide is included to help you through the server and client set-up processes. If you're a beginning web master or web content developer, you need to familiarize yourself with web server security and configuration before attempting to install and configure the server portion of Web Integrity.
Conclusion
Web Integrity is an excellent tool for bringing version control and configuration management to your web sites. It has a simple user **interface** , good security, and several SCM tool features until now found only in traditional SCM tools. MKS realizes that it isn't necessarily programmers developing web content, but frequently, the business matter experts, and has targeted the user **interface** and processes accordingly.
REVIEW
Web Integrity 2.1
US$49 per seat
Mortice Kern Systems, Inc.
(MKS)
185 Columbia Street West
Waterloo, Ontario, Canada N2LSZ5
800-613-7535, (519)884-2251
Fax (519)884-8861
http://www.mks.com/
Mike Finn is a CPD and systems engineer at EDS in Rochester, New York. His interests are in Intranet application development and distributed technologies. mjfinn@frontiernet.net.

Special Features: table; illustration
Company Names: Mortice Kern Systems Inc.--Products
Descriptors: Software Single Product Review; **Internet** /Web Server Software
Product/Industry Names: 7372682 (Internet Server Software)
SIC Codes: 7372 Prepackaged software
Trade Names: Web Integrity 2.1 (**Internet** /Web server software)--Evaluation
File Segment: CD File 275

DIALOGWEB.
Guided Search | new search | favorites | settings | cost | logoff | help

Dynamic Search: Computers, Electronics, and Telecommunications
Records for: *toolbar*

save as alert... | save strategy only...

Output | Format: Full Record ▽ | Destination: Browser ▽ | display / send
Modify | | refine search | back to picklist

select all none | **Records 62 of 154 In full Format**

□ 62. **3/9/62 (Item 62 from file: 275)**
02040476 **Supplier Number: 19143357 (This Is The FULL TEXT)**
HTML goes WYSIWYG: two Mac-based editors.(Adobe PageMill 2.0 and Claris Home Page 1.0) (includes table of product information) (Software Review)(Evaluation)

Persky, Jim
LAN Magazine , v12 , n3 , p121(5)
March , 1997
Document Type: Evaluation
ISSN: 1069-5621
Language: English   **Record Type:** Fulltext; Abstract
Word Count: 3768   **Line Count:** 00333

Abstract: Claris' $99 Home Page 1.0 and Adobe Systems' $99 Adobe PageMill 2.0 Web page authoring tools both use a WYSIWYG **interface** to make designing and editing Web pages more intuitive. Adobe PageMill offers more features, but Home Page is fairly simple. Adobe PageMill offers two modes to edit and preview Web pages. A third editing mode allows users to edit HTML code directly. Adobe PageMill has a variety of useful tools for creating and designing tables, and the program also supports server-side and client-side image maps. The program does not support JavaScript or ActiveX HTML code, however. Claris Home Page 1.0 provides an intuitive environment for creating links and formatting text but does not support client-side image maps. Home Page also can create libraries of frequently used design elements, such as graphics, logos and text.

Text:

The days of designing Web pages by inserting cryptic HTML code via a text editor, followed by launching a Web **browser** to check your work, are numbered.

Although you might experiment with creating your first few Web pages by churning out HTML code with an ASCII text editor, you'll soon wish for an easier way to get the work done. Fortunately, the market now has Web page authoring tools that help you automatically create HTML code while working in a WYSIWYG environment. HTML editors let you see the page as you create it, without typing in HTML code, and let you make instant modifications. Hot-shot HTML code-slingers, fear not: These tools not only generate the run-of-themill HTML code for the basic page; they also let you add in your own advanced HTML code.
    In this Test Drive, I took a look at both Adobe Systems' PageMill 2.0 and Claris' Home Page 1.0. Both run on the Macintosh, but Home Page is also available for the Windows platform. (For this Test Drive, I only reviewed

the Mac version.)

ADOBE PAGEMILL 2.0

PageMill comes with software on three floppy diskettes, a CD-ROM that includes additional third-party software, tech notes, clip art, templates, and many other goodies to help you develop and enhance your Web page. Installation is typical of most Macintosh applications: Start the system with extensions turned off, run the installation program, then reboot the system. The only decision to be made is whether you want to do an easy install (which installs all the components) or a **custom** install (which lets you pick and choose what you want). The installation program automatically decompresses the files and places them in the correct locations on the system.

DEVELOPMENT ENVIRONMENT

PageMill operates in two primary modes: Edit and Preview. You create and modify Web pages in Edit mode. Preview mode allows you to view the page as it would appear via a Web **browser** . However, you can also call a **browser** directly from PageMill to see how that **browser** would interpret the page. In Edit mode, the **toolbar** located at the top of the page becomes active, as does the floating Inspector Palette (see Figure 1). The **toolbar** contains options for text formatting, inserting tables, image placement, and a few other helpful editing tasks. The icons didn't make much sense to me, but luckily a text description of each one appears when you position the mouse pointer over the icon. The Inspector palette displays information about the current page or selected elements and has four panels with controls and options for frames, the forms page, objects, and the current page.

An additional editing mode enables you to edit the HTML code directly, which is necessary if you add advanced **custom** page content, such as JavaScript or Activex Controls, which PageMill 2.0 does not support. lo prevent PageMill from making a mess of code it doesn't know how to cope with, you must insert the tags and <
!-/noedit--> before and after the code in question. This tells PageMill to ignore the script delimited by the noedit tags.

Entering and editing text in PageMill is similar to using early word processors that had jest enough features to get the job done. You can enter text by either typing into the page directly or importing from other files by cutting and pasting or dragging and dropping. The text import filters allow you to open a word processing file directly into PageMill--but my attempt to read a Microsoft Word 6.0 file was unsuccessful. There is a reference to the readme file for a list of word processing and database applications that PageMill supports, but nothing was listed.

Once you enter the text onto the page, PageMill provides a number of tools for formatting the layout and changing the character fonts. There's even a spell-check tool and a global find-and-replace function. Instead of first entering text into a word processor, then much you can do with tables, I found them to be one of PageMill 2.0's most useful tools. It takes a little time to master controlling all that you can do with each cell and how they fit into the table, but the end result is well worth it.

To gather information from visitors to your Web site, you can create an HTML form, which prompts the user for input and then sends the data to the Web server for processing via a CGI (common gateway **interface**) script. PageMill can't help with the scripting or the data processing, but it can aid in producing the HTML code for the form. PageMill supports the form objects available in HTML 2.0. Such objects include the check box, radio button, text area, text field, and pop-up menu objects. lust as with creating tables, there is a button for creating forms, and you can further **customize** each **object** via the Inspector.

ODDS AND ENDS

Transferring the completed set of Web pages to the Web server worked flawlessly. In the Preferences Setup menu, I chose Unix as the server target, and PageMill 2.0 appropriately set the correct carriage return and line feeds for the HTML ASCII files. Another tool is what I call the "download guestimator." Its purpose is to give you a sense of the amount of time it will take a reader to download the Web page, based on his or her

connection to the **Internet** . After 15 different tests of the same page from two Web servers using three connection speeds--and getting fifteen different actual results--I'd say that the best the guestimater can provide is...a guess.

CLARIS HOME PAGE 1.0

Claris Home Page 1.0 is the first release of a cross platform (Windows 95, Windows NT, and Macintosh) WYSIWYG web authoring tool. For this review, I tested the Macintosh version of the software. (Editor's note: As of this writing, Claris has announced Home Page 2.0, but the product was not shipping in time for this review.)

The rest was the standard Macintosh installation process of starting the system with extensions off, installing the software, and then rebooting the system.

I chose the easy install option, which creates some folders that contain clip art, tutorials, images, sample HTML files, and a help folder The help folder is real nice. It contains HTML files of the user's guide, troubleshooting, and shortcuts--all accessible from the Help menu.

DEVELOPMENT ENVIRONMENT

When creating Web pages with Home Page 1.0, there are three environment modes: Edit Page, Preview Page, and Edit HTML Source. The main mode is Edit Page mode, which is similar to working with a word processor and is the mode you use to generate the HTML 2.0 code. In Edit Page mode, four toolbars become active: basic **toolbar** , the style **toolbar** , the tool palette, and the image map editor The basic **toolbar** provides functions such as switching between modes, inserting tables, and inserting graphics. The style **toolbar** is for formatting text and is limited to the text formatting capabilities of HTML 2.0. The tool palette is a floating palette, which means you can move the palette anywhere on the page to insert elements, such as a check box for a form or an anchor for a URL link. You use the image map **toolbar** for adding special features to an image such as creating an image map that users can dick on or making a portion of an image transparent to let the background of the Web page show through.

Preview mode gives you some idea of what the page will actually look like. Preview mode is fairly limited in displaying more advanced Web page features such as frames and hot spots in image maps, but it does give you the option of previewing the Web page using a **browser** . Edit HTML Source mode displays the exact HTML code of the Web page and allows you to edit the source directly. For code not recognized by Home Page, there is an Extra HTML field that you can use to add any nonsupported code (see Figure 3). The test code I manually typed in, which Home Page didn't recognize, showed up in WYSIWYG mode in red. The code did work, though, when I previewed with another **browser** . One feature I appreciated when creating pages with Home Page was the direct access to the HTML-based online documentation. By simply clicking on the Help icon, you can access the entire manual, which is easier to navigate and more up-to-date than the printed manual, and it contains shortcuts and tips.

Before creating a page, it is a good idea to set up the Home Page preferences. These preferences include options such as the type of file format to produce (for example, the necessary line feeds for the server platform), which **browser** to use when you've had it with the Preview mode, where to save converted images, what type of images to save (interlaced or not), and a few other options. For this review the server output was Unix, the **browser** was Netscape 2.0, and all image files were saved as interlaced.gif files.

Working with text is similar to using a word processor, except there is no spell-check tool and you are constrained by the limits of HTML 2.0. You can format paragraphs within the definitions of HTML 2.0, which include different level headings, text displayed in the monospace font of the **browser** , text lists, number styles (roman or arabic), block quotes, and alignment. Character formatting options include both logical and physical styles, as well as raw HTML. Logical styles allow different browsers to interpret the style within their limitations, while physical styles look the same regardless of **browser** type. You can add a special character,

such as a trademark symbol, by entering ?abe; (including the semicolon), where abe is a decimal number representing the ANSI value for that character in the ISO Latin-1 character set. For example, to enter the registered trademark symbol, I enter ® while in Edit Page mode; I then select the text and choose Raw HTML from the Style menu. For some reason, I had to save the file, dose it, and then reopen it for the **browser** to interpret the code. In general, I found managing the text layout, such as list formatting and character styles, very intuitive and functional.

Web page images must be in either .gif or .jpeg format. Home Page supports both, and it has the ability to automatically convert .bmp files on Windows and .pict files on Macintosh to .gif format. When adding a .gif or .bmp image to a Web page, Home Page creates a pointer that indicates where the file resides. If the image is a .pict or .bmp file, Home Page creates a .gif converted file and places it in a default image folder, which you can define when setting up preferences.

Two common image manipulations in Web pages are changing standard .gif files to interlaced .gif format and adding transparency to an image. Saving files in interlaced .gif format is a Preferences option, and you can add transparency with the Image **Object** editor, which allows you to modify an image's attributes. These attributes include sizing, behavior (image map, form button, normal image), alignment, and support for adding extra HTML code for advanced editing.

I tested importing and editing .gif, .jpeg, and .pict files, and the **Object** editor handled all of them in the same way. For fun, I tried importing an animated .gif file-which promptly locked up the system. Just as with PageMill, resizing the image only changes the size at which it appears in the Web page, not its file size. Thus, if you import a full-page image of 50KB and adjust it to be a fraction of the page, it is still a 50KB file and will take awhile to download. You can change the actual file size of images only with an image editing tool, such as Adobe Photoshop.

LINKS

Hypertext links are one reason that presenting information on a Web platform is so powerful. Links allow readers to easily navigate from page to page, regardless of that page's location. Home Page provides an easy environment for creating links to other Web pages, specific locations within a Web page (via anchors), fip sites, and e-mail addresses. To create links, you can either search for the file via a **browser** option or you can directly enter the URL. The browse feature is real nice, and it makes internal site links very easy. You can create an anchor by positioning the cursor where you want to place the anchor, then clicking the Insert Anchor button. Next, you create the link to the anchor: first choose the text to make the link with, then pick Link to URL, and lastly select the anchor you want. It's all very intuitive.

To create an image map with Home Page 1.0, you select the **Object** editor (or simply double-click the in, age), and the **Object** editor automatically comes up. The manual gives a different description and a misleading screen shot; the way it actually works is simpler because the Image Map editor comes up automatically with the appropriate **toolbar** . There are only two shapes for hot spots supported: a circular link and a rectangular link. After outlining the area for the hot spot, a double-click on the hot spot opens up the Link editor and allows you to specify the URL. Home Page then saves the code for the image map in NCSA-compatible image map files. This means that in order for the image map to work, the Web server must be running an image map CGI script. There is no support for client-side image maps, although Claris has announced that this feature will be available in release 2.0.

TABLES AND FRAMES

Creating tables is a simple matter of placing the cursor where you want the table to be located and then choosing Table from the Insert menu. The default table created consists of two rows and two columns, but with the Table **Object** editor you can set the attributes of the table and individual cells. You can enter text and images by positioning the cursor in the cell where you want to enter the data, then either directly entering the data or importing from another file. If the image or text is larger

than the cell, the cell expands downwards in the same row, but the width of the cell remains the same. As with PageMill 2.0, Home Page supports nested cells. Anything that you can place on a Web page can be placed within a cell of a table.

You create frames in Edit Frames mode by choosing New Frame Layout from the file menu. Because frames were a feature of the Netscape extensions to HTML 3.0, Home Page automatically adds an explanatory message for nonframe-supporting browsers. The first step is to divide the page into the frames you want. Next, set the URL for the frame and define other attributes such as scroll bars, margins, and size. Unfortunately, the wonderful Find File option available with linking in Edit mode didn't make it into Frame mode. To support a table of contents using frames, you can display the target page in any of the pages of the frame set. However, unlike PageMill, where you simply hold down the mouse and drag to where the target page is to be displayed, Home Page requires a rather cumbersome 11-step process.

FORMS

Home Page supports all the form objects of HTML 2.0 and can contain tables, objects, text, and so forth. Just as with Adobe PageMill 2.0, you can have one form per page. To create a form you place the cursor where you want the form and choose Forms from the Insert menu. For each element of the form, there are different options available in the **Object** editor. For example, you can set a maximum length for a text field, and you can set a check box to be either a radio button or a check box. You can easily create pop-up menus, scrolling lists, submit buttons, and hidden text, and you can set their properties via the **Object** editor. Like all forms, the server calls a CGI script to process the data, so you cannot test the form until the script is written.

ODDS AND ENDS

Home Page supports creating libraries to hold frequently used Web page elements such as boilerplate text, company logos, and so on. There is a separate menu for creating libraries, which you access under the File menu. A window appears with the library name or icon on the top and the contents of the library on the bottom. You transfer data from a library to a Web page by opening both the library and the Web page and then dragging the library entry to the page. Entries can be modified or deleted and multiple libraries are supported.

CONCLUSION

Both Adobe PageMill 2.0 and Claris Home Page 1.0 create solid HTML code in a clear and easy-to-learn environment. PageMill shows the advantages of a second release with a greater feature set, but it is slightly more difficult to use. Home Page is extremely simple, but lacks some of the features advanced designers may require. In either case, creating a Web page in WYSIWYG mode is, in most cases, faster and easier than the method I've been using: vi on a Unix box.

Jim Persky is president of Pacific **Internet** , a Ukiah, CA-based **Internet** service provider. He can be reached at jim@pacific.net.

EXECUTIVESUMMARY:

Manufacturer: Adobe_Systems
                       1585_Charlesten_Rd.
                       P.O._Box_7900
                       Mountain_View,_CA_94039-7900
                       (415)_961-0590

Price: $99

Requirements: Macintosh_with_System_7.1_software_and
                  68020_or_higher,_or_a_Power
                  Macintosh_with_System_7.1.2._Dragging
                  and_dropping_between_Adobe
                  PageMill_and_other_applications_requires
                  System_7_Pro_or_later._Adobe
                  PageMill_needs_4MB_RAM_(5.SMB_for_Power
                  Macintosh),_10MB_of_available_hard_disk

space,_a_4-bit_grayscale_monitor_or_8-bit
color_monitor,_QuickTime_2.1,_and_the
QuickTime_PowerPlug,_which_is
required_for_the_Power_Macintosh_only.

Installation: Typical_point-and-click_Macintosh
installation--in_other_words,_very
simple._The_majority_of_the_installation
process_is_spent_filling_out_the
registration_form.

Documentation: The_user's_guide_contains_an_excellent
tutorial,_and_there_is_a_chapter
on_basic_concepts,_as_well._As_a_reference
tool,_it_is_well_presented
and_very_easy_to_look_things_up_in._The
manual_has_excellent_references
for_more_information_throughout,_and_it
has_a_complete_index_and_helpful
appendices.

Technical   PageMill_is_a_level-1_product,_meaning
support   you_get_person-to-person_help
for_one_incident._Additional_person-to
person_support_is_available_on
a_fee_basis._I_called_once_and_was_able
to_speak_with_a_knowledgeable
support_person,_who_solved_the_problem
within_a_few_minutes._The
company_also_provides_email_and_Web-based
support,_fax-based,_and_an_included
CD-ROM_provides_technical_notes.

Warranty: Ninety_days

Ease_of_use: The_software_follows_Macintosh
conventions_well,_so_most_Macintosh
users_will_find_it_easy_to_create_Web
pages_without_learning_any_HTML.

Creating_more_complicated_pages_using
nested_tables,_frames,_graphics,_and
forms_is_not_difficult,_but_linking
could_be_improved_with_a_file_searching
feature._A_basic_understanding_of_how_the
Web_works_and_a_thorough_knowledge_of
file_locations_and_how_links_work_is
essential.

Robustness/   Forms,_nested_tables,_graphics
compatibility: translation,_and_image_maps_are_all_well
supported._Advanced_Web_masters_will
appreciate_the_ability_to_drop_directly
into_HTML_code_editing_to_add_new_features
as_well_as_being_able_to_hide_unfamiliar
HTML_code,_such_as_JavaScript_and_Activex
Controls._Exchanging_date_between
applications,_as_well_as_transferring
files_across_different_platforms,_is_well
supported._The_product_is_very
compatible_with_other_Adobe_presentation
publishing_products,_such_as_Adobe
Photoshop_and_Adobe_PageMaker--as_well_as
Microsoft_Excel_for_inputting_information
into_tables._imported_HTML_generated

either_from_another_Web_authoring_tool_or
directly_edited_worked_well.

Applicability: The_product_is_simple_enough_for_novice
Web_developers_who_have_mastered_the
Macintosh_and_who_understand_Web_page
fundamentals.

Its_tight_integration_with_other_programs
and_support_for_advanced_Web_page
development_make_it_a_real_time-saver_for
Webmasters_wanting_to_focus_more_on_design
and_content_presentation_than_on_HTML
syntax.

Product:
Claris Home Page 1.0
Manufacturer:
Claris 5201 Patrick Henry Dr. Santa Clara, CA 95052 (408) 727-8227
Price:
$99
Requirements:
Windows version requires Windows 95 or Windows NT 3.5.1 or later, an
Intel 486-compatible PC, 8MB of available memory if you're using Windows 95
(16MB for Windows NT); 4MB available hard disk space and a 3.5-inch
high-density drive. Macintosh version requires a Power Macintosh or
Macintosh with 68020 or higher processor, System 7.1 or higher, 8MB of
available RAM, and 6MB available hard disk space for the full installation.
Installation:
Easy; it's the typical point-and-click Macintosh installation.
Documentation:
The brief user's guide is written for both Macintosh and Windows
users, and does a good job of covering the differences without cluttering
the manual; however, it only touches the basics of each area. A more
in-depth discussion of topics such as image manipulation and Java
support-as well as a mere complete index-would be nice. The manual, along
with design and troubleshooting tips, are available in HTML format, which
you can access at any time during page development.
Technical Support:
Telephone hotline support is available from 6 a.m. to 6 p.m. Pacific
time, Monday through Thursday; 6 a.m. to 2 p.m. on Friday. Standard product
support is available free for 90 days from your first call to Claris
technical support. I made a number of calls to Claris, and the support
staff wes excellent. The waiting time was very short, and all my questions
were answered either immediately or soon after a little research. There is
a TDD line for the hearing impaired. Additional support services can pe
purchased on an as-needed basis for $2.00 per minute. A complete selection
of 24-hour, seven-day-a-week online support is available at the company's
Web site and via CompuServe, American Online, and fax-pack.
Warranty:
Ninety days from the date of purchase.
Easy of use:
Using the program is very similar to using a word processor, and,
armed with a general understanding of Web pages, most users will find Web
authoring with Clads Home Page 1.0 easy.
Robustness/compatibility:
Importing and exporting pages between different platforms, as well as
editing pages created with other Web authoring tools, worked fine. Preview
mode is limited, so a third-party browser, such as Netscape Navigator, is
required to view the pages.
Applicability:
The product is very Macintosh-like and well suited for the most
novice of Web page developers. Anyone who needs to create a simple Web page
and who has a basic understanding of the Macintosh and the Web can produce
pages effortlessly. The product is a little behind in terms of support for

```
HTML 3.0 Netscape extensions such as frames and plug-ins, so advanced Web
developers may want to wait for release 2.0.
        Test environment:
        Web authoring system: Apple Power Macintosh 7100/80 with 48MB RAM,
750MB hard disk drive, Macintosh System 7.5.3. Web server: 133MHz
Pentium-based PC compatible with 128MB RAM and 6GB hard disk, running Unix
(BSDI Internet Server 2.1), with an Apache 1.1.1 Web server. ISDN (one B
channel, or 64Kbps) connection to the Internet.

COPYRIGHT 1997 Miller Freeman Inc.
```

Special Features: illustration; table
Company Names: Claris Corp.--Products; Adobe Systems Inc.--Products
Descriptors: Software Multiproduct Review; Web Authoring Software
SIC Codes: 7372 Prepackaged software
Ticker Symbols: ADBE
Trade Names: Claris Home Page (Web authoring software)--Evaluation; Adobe PageMill 2.0
(Web authoring software)--Evaluation
File Segment: CD File 275

DIALOGWEB.

Guided Search | new search | favorites | settings | cost | logoff | help

Dynamic Search: Computers, Electronics, and Telecommunications

Records for: *toolbar*

save as alert... | save strategy only...

Output | Format: Full Record | Destination: Browser | display/send

Modify | refine search | back to picklist

select all none   **Records   83   of   154   In full Format**

☐ 83. **3/9/83 (Item 83 from file: 275)**
01969438   **Supplier Number:** 18590001
Delphi Client/Server Suite. (from Borland International Inc)(one of eight packages evaluated in "Web Database Tools") (Software Review)(Evaluation)(Cover Story)

Childers, Mark
PC Magazine , v15 , n15 , p207(3)
Sep 10 , 1996
Document Type: Evaluation Cover Story
ISSN: 0888-8507
Language: English   **Record Type:** Fulltext; Abstract
Word Count: 1031   **Line Count:** 00086

Abstract: Borland's $1,995.95 Delphi Client/Server Suite 2.0 includes powerful tools for creating client/server applications for the Web, but it requires a considerable amount of Pascal DLL coding and manual Web page development. Delphi supports both the **Internet** Server API (ISAPI) and the Netscape Server API (NSAPI), as well as CGI. The system includes DeltaPoint's QuickSite HTML editor and NetManage's **Internet** Solutions Pack of ActiveX controls for developing **custom** intranet applications. The Borland Database Engine (BDE) resides on the Web server and provides access to all the databases supported by the Delphi environment, including DB2, Informix, Interbase, Microsoft SQL Server, Oracle and Sybase SQL Server. Also included is the ReportSmith LAN-based report writer and Quick Soft Development's Quick Reports for simpler reporting. The combination of compiled DLLs and ISAPI/NSAPI support is tough to beat for fast Web development.

Text:

```
List price: $1,999.95.

Borland International Inc.,
     Scotts Valley, CA;
     800-932-9994, 408-431-1000;
     fax, 408-431-4122;
     www.borland.com.
```

Suitability to Task: Delphi Client/Server Suite

	Power	Ease
Interface development	Fair	Fair
Database connectivity	Good	Excellent
Application partitioning	N/A	N/A
Database development	Good	Good

N/A--Not applicable: The product does not support this feature.

Borland International's Delphi enjoys a deservedly high reputation as a tool for building LAN-based client/server systems. If you're looking to build client/server applications for the World Wide Web, you'll find that Delphi Client/Server Suite 2.0, the current release, offers a powerful if somewhat brute-force solution that demands a heavy investment in Pascal DLL coding and manual Web page construction.

Whatever the approach lacks in RAD-like ease and elegance, however, is made up for by the speed and flexibility of the deployed site. Delphi now incorporates support for both ISAPI and NSAPI, in addition to CGI. That, along with Delphi's ability to generate DLLs, gives you enormous versatility and plenty of performance. Delphi applications must be deployed on a Windows server platform, typically Windows NT, and used with a Windows-based Web server.

Thanks to licensing agreements, Delphi now includes two strong Web-focused tools: DeltaPoint's QuickSite, a capable HTML editor, and the **Internet** Solutions Pack from NetManage, a collection of ActiveX controls well-suited for developing **custom** intranet applications.

Site Construction

Building the test Web site for this review involved two distinct processes. We began by creating and managing the HTML pages that provide the user front end using QuickSite. These HTML pages act as templates and include special inserted tags (we used "%S") to identify data fields that will be manipulated later. Although building pages in QuickSite is straightforward, Delphi is not able to generate HTML forms automatically by querying the column definitions of your database.

The next step is to create a DLL for data-driven pages (a single DLL can run multiple pages, if desired). In operation, the **browser** actually opens the DLL via ISAPI or NSAPI, instead of opening the HTML page itself. The DLL reads in the generic HTML file and populates the predefined tags with values retrieved from a database query that is executed through the DLL. It then returns a final HTML string back to ISAPI and ultimately to the user's **browser** via HTTP.

One advantage to a DLL-based approach is that it allows you to program your Web site to do just about anything. Another is that native 32-bit DLLs inherently let you take advantage of Windows NT's multithreading and Web-server resource management.

But building those DLLs can be a time-consuming process. And because they don't require visible components, you will not be leveraging the strength of Delphi's excellent graphical painters (remember that only an HTML string can be sent back to a standard **browser**). For the most part, developing Web-based applications feels like a step back to the days before tools like Delphi existed. Most of your time will be spent coding in Pascal, and you'll need a high degree of programming expertise.

One major advantage of Borland's **Object** Pascal language is that it lets you quickly build a library of objects that will speed future development. As an example, Borland took a few hours to create an HTTP Pascal unit for this review that can be compiled with your DLL. This library hides the actual HTML codes from the developer, substituting functions like the ability to populate a drop-down list box control on the page with a database query. Borland will make this library freely available on its Web site.

Database Connections

Database support is provided by the Borland Database Engine (BDE), which must be installed and configured on the Web server, allowing access to all of the databases supported by the Delphi environment. The extensive list includes native support for IBM DB2 (16-bit version only), Informix, Interbase, Microsoft SQL Server, Oracle, and Sybase SQL Server. ODBC and IDAPI data sources are also supported, and BDE can manage heterogeneous database queries.

BDE loads into memory on the Web server with the first ISAPI or NSAPI call. From then on it is available and manages the database connections. By staying resident while the Web server is operational, it provides persistent database connections for multiple users--this in contrast to

typical CGI-based applications, which connect and disconnect from the
database with each request. BDE minimizes the number of required database
connections and provides connection management by creating and deleting
connections based on load.

Delphi offers quite a few options when it comes to LAN-based
reporting. It ships with the full-featured ReportSmith as well as Quick
Soft Development's Quick Reports, for less intensive reporting tasks.
Neither of these translates to the Web environment, though. In theory, you
can present any data that can be derived from a SQL query, but building
complex report types, such as crosstabs, is reserved for the true SQL and
Pascal gurus.

Our tests did not require us to use the bundled **Internet** Solutions
Pack, but it forms a valuable addition to the product. The controls appear
on the **toolbar** 's **Internet** tab and integrate seamlessly with the Delphi
environment. You can add a Web **browser** to a Delphi application simply by
dropping three controls (a **browser** control, a drop-down list box for
typing in URLs, and a push button) on the form and adding one line of code.
Other NetManage controls allow you to work with **Internet** mail, FTP, or
network newsgroups.

For LAN development, Delphi has come a long way in a short time,
thanks to its 32-bit, **object** -oriented development environment, its rich
Pascal language, its intuitive IDE, its support for ActiveX (i.e., OLE)
controls, and its true compiler. For the Web, where speed and response time
are of paramount concern, Delphi's compiled DLLs and ISAPI/NSAPI support
are a bit short on elegance, but they're a tough combination to beat.

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Special Features: illustration; other
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Descriptors: Software Single Product Review; Application Development Software
SIC Codes: 7372 Prepackaged software
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Evaluation
File Segment: CD File 275

DIALOGWEB

Guided Search | new search | favorites | settings | cost | logoff | help

❖ **Dynamic Search:** Computers, Electronics, and Telecommunications

🗎 **Records for:** *toolbar*

save as alert... | save strategy only...

Output 🗗 | Format: Full Record | Destination: Browser | display / send

Modify 🗗 | refine search | back to picklist

select all none

Records 92 of 154 In full Format

☐ 92. **3/9/92 (Item 92 from file: 275)**
01944256 **Supplier Number:** 18315420 **(This Is The FULL TEXT)**
Client/server and host application development tools.(1996 Database Buyer's Guide and Client/Server Sourcebook)(Buyers Guide)

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Abstract: A buyer's guide of 99 host and client/server application development software packages is presented. Information presented includes a brief description of each product, pricing information, operating system and other software requirements, the vendor's location, and a telephone number and World Wide Web address, when available, for each vendor. Products presented include a client/server front-end application environment that links to Oracle, Sybase or other SQL servers, a 4GL application development environment, a tool that integrates logic-bases and other databases, a batch reporting tool for PowerBuilder users and a business application development environment for Windows.

Text:

```
4D Enterprise

ACI US Inc., Cupertino, CA 408-252-4444; 800-881-3466
     A client/server, end application development environment. Users can
connect to Oracle, Sybase, or other SQL servers. Licensed for one developer
and for unlimited deployment. Designed as a developer tool its development
kit is equipped with 4D Insider, a full-featured cross-referencing utility,
and 4D Compiler Pro, a true machine language compiler for Macintosh and
Windows. The products deployment kit gives users two deployment options.
The first is to use the runtime to deploy the application to any number of
users. The second is to use this product as an application server. This
option gives users the current version of the application at all times.
http:/www.aci-4D.com. Reader service 213.
     4D Server ACI US Inc., Cupertino, CA 408-252-4444; 800-881-3466
     A cross-platform client/server, relational database for Windows NT,
Windows 95, Windows 3.1, Macintosh, and Power Macintosh. Features a unified
client/server architecture that optimizes database performance and provides
a transparent interface in a heterogeneous hardware environment. Also
features a programming language and platform-independent technology. Also
contains 4D Backup, a complete backup and mirroring program. http:/www.
```

aci-4D.com. Reader service #214.

4S-SuperNova 5.0 Four Seasons Software, Edison, NJ 908-248-6667; 800-949-0110

A dynamically partitioned 4GL application development environment. Features include: dynamic online application partitioning, visual application partitioning management, workgroup management, and configuration management of application development. Portable across multiple platforms (Unix, VMS, and DOS) and support character-based and Windows, Windows NT, Windows 95, Motif, and Openlook interfaces. Interfaces with Tuxedo and Top End transaction monitors. Supports Informix, Oracle, Sybase, Ingres, Teradata, DB2/6000, HP Allbase, C-ISAM, dBASE, Btrieve, Flat ASCII, In-Core, ODBC, EDA/SQL, Rdb, RMS, FoxPro, and others. http://www.4seasons.com. Reader service #215.

Accell/SQL 2.5 Unify Corp., Sacramento, CA 916-928-6400

A Unix-based application development system designed to bring open systems productivity to application developers. Applications are portable to Oracle, Informix, Sybase SQL Server, SCO Integra, and Unify 2000 RDBMSs -- with no additional programming. Its open systems architecture redistributes application processing across multiple hardware platforms, optimizing the performance of client/server environments. A single application can run with a variety of character- and X-based GUIs, including Open Look, Motif, and Windows. Combines both an application generator and complete 4GL to deliver a high level of productivity for developers. A full-function 4GL enables developers to program by exception, requiring code only for special cases not solved with the application generator. Reader service #216.

Aion Development System 6.4 Platinum Technology Inc., Oakbrook Terrace, IL 800-442-6861

An application development environment for complex business applications. A member of Platinum Technology's Application Lifecycle Solutions family of products. Combines OO programming with rules-based programming to enable development productivity for applications that must respond to rapidly changing business requirements. Works with Platinum RuleServer, which is the server runtime for implementing a three-tier client/server architecture, and lets user's extend the business logic of existing applications and create new distributed applications. Runs on Windows 3.1, Windows 95, Windows NT, OS/2, HP-UX, IBM AIX, Solaris, MVS/CICS, and MVS/IMS. http://www. platinum.com. Reader service #217.

Amzi! Prolog + Logic Server Amzi! Inc., Stow, MA 508-897-7332

Enables the easy integration of logic-bases with databases, allowing users to add integrity-checking and semantic integrity rules for tables, verification rules with forms, and parsing/translation rules for unformatted records. Users can also add logic-bases that provide advice, enforce business rules, and evaluate systems. The Logic Server accesses a logic-base of rules just as a database server accesses information. The rules are expressed in the Prolog language, with search and pattern-matching capabilities. Logic bases can access any ODBC database as part of the rules, letting users reason over data from many sources. The Logic Server can be embedded in applications written in Delphi, Visual Basic, Access, PowerBuilder, DBASE, C/C++, and any Windows application that can call a DLL. Includes royalty-free, distributable runtimes. Supports 16- and 32-bit Windows 3.x, Window; 45, Windows NT and DOS. Both Personal and Professional Editions are available. $298 to $598. http"//www.amzi.com. Reader service #218.

Axiant Cognos Inc., Ottawa, ON, Canada 617-229-6600

A client/server development environment that meets a wide range of needs, from traditional transaction-processing functions to graphical access to corporate information. Enables developers to build applications that leverage the processing power of both clients and servers, as well as against multiple databases on multiple platforms. Axiant Developers' Edition includes the Developers' Workbench, Impromptu, and PowerPlay. Business functions are deployed to the optimal processing platform, with five different deployment topologies: mobile, client with data server, client with application server, functionally distributed (mixed), and server-only. The Developers' edition is on Intel PCs running Windows for

Workgroups 3.11. Axiant applications can process on the client or the
server, accessing databases that reside on Solaris 2.x, Digital OSF/1, Open
VMS (VAX and Alpha), HP-UX, IBM AIX, and DG/UX. Data connectivity is
supported through ODBC drivers and native APIs from the leading database
vendors, as well as de facto networking standards, such as Noveu, Microsoft
LAN Manager, DEC-net, and TCP/IP. Reader service #219.
       BatchBuilder PowerCerv Corp., Tampa, FL 813-226-2600
       A tool for PowerBuilder developers who need to perform batch porting
or need to offload nonuser intensive processes to background servers.
Batched processes can be prescheduled or requested online. They can be
PowerBuilder- or non-PowerBuilder-based. An open systems, client/server
equivalent to JCL, bringing automated job routing and asyndcronous
processing to PowerBuilder applications. Features include workload
distribution, a reusable asynchronous engine, automated job routing,
off-line execution of user-submitted jobs, automated server load
management, and prescheduling of periodic jobs and reports. it is network-
and database-independent. http:/www.powercerv. com. Reader service #220.
       c-tree Plus File Handler FairCom Corp., Columbia, MO 573-445-6833;
800-2318180
       Based on an advanced b+tree (balanced) algorithm; handles all aspects
of database I/O control. Users can employ low-level routines or high-level
ISAM routines for random or sequential access. Distributed in complete ANSI
C prototyped source, ported to more than 100 environments. Lets users
develop single-user or multiuser nonserver applications royalty-free. Lets
users migrate existing c-tree Plus applications to the FairCom server by
recompiling the application. Available for DOS (Microsoft C, Borland C,
Symantec, Zortech, and Watcom), Windows Microsoft C and Borland C,),
Microsoft NT, OS/2 (Microsoft C, IBM c/set, and Borland OS/2), IBM RS/6000,
Sun, 88Open, HP9000, and Macintosh. $895. http://www.faircom.com. Reader
service #221.
       CA-OpenROAD Computer Associates International Inc., Islandia, NY
516-342-5224; 800-225-5224
       An OO, repository-driven application development tool suite, based on
Ca-windows 4GL. Extends a suite of built-in development tools;
developer-controlled color; radio, palette, and control fields; a
programming language; vendor-supplied class libraries; and debugging tools.
Built around a full-function repository, which coordinates data definitions
and program elements to generate OO GUI applications. Includes drivers to
CA-Ingres, Oracle, Sybase, and Microsoft SQL Server. Includes
encapsulation, unlimited user-defined classes, inheritance, and
polymorphism. Reader service #222.
       CA-Visual Objects Computer Associates International Inc., Islandia, NY
516-342-5224; 800-225-5224
       A business application development system for Windows. Combines an OO
language with access to databases in client/server environments. Based on
an active OO repository, it provides the ease of use and fast prototyping
capabilities of visual programming environments. A robust, extensible, OO,
native-code compiler integrated with a GUI development environment and
replaceable database drivers. Database applications that require access to
disparate databases on multiple platforms as well as other business
applications and system-level programs, can be created without the coding
necessary in languages such as C or C++. Users can prototype applications
using visual techniques and then complete them using OO techniques. Reader
service #223.
       CA-Visual Realia Computer Associates International Inc., Islandia, NY
516-342-5224; 800-225-5224
       A Windows development environment providing Cobol programmers with the
tools to create GUI client/server applications. Uses Cobol for the business
logic and GUI Windows tools for the user **interface** and facilitates the
development of new GUI corporate applications while allowing legacy systems
to acquire a GUI front end. The program's user **interface** can be created
by dragging controls onto forms, and then modifying the control's
properties. Incorporates both Cobol **custom** controls and other controls
for bitmaps and data grids for adding charts, spreadsheets, and animation.
Simply draw the Windows objects, such as buttons, list boxes, bitmaps, and

edit fields, and it generates the code. integrated debugging of user **interface** code and Cobol application code. Application runtimes can be distributed royalty free throughout an enterprise. Reader service #224.

Centura Centura Software Corp., Menlo Park, CA 415-32(-9500; 800-444-8782

A set of products for building and deploying scalable, **Internet** -enabled client/server applications. Lets users unite disparate databases and integrate mobile users in a decentralized enterprise. Centura Team Developer lets development teams create applications that can incorporate data from any data source. Centura Ranger offers heterogeneous data replication so users can deploy applications in a decentralized corporate environment using both desktop and mobile computers. Centura Application Server provides support for three-tier development and application partitioning. Centura Web Data Publisher lets users Web-enable both applications and data. Centura Team Developer costs $4995 per developer, and includes a copy of Centura Ranger. http:/www.centurasoft.com. Reader service #225.

Centura Team Developer Centura Software Corp., Menio Park, CA 415-321-9500; 800-444-8782

A client/server development environment for creating scalable applications that can incorporate data from any data source. Include three-tier architecture, team development support, **object** orientation, and fast, compiled code. Users can choose between two-tier and three-tier architecture. A three-tier wizard simplifies access to DCE servers, TP monitors, or other application servers. The architecture supports application partitioning of business objects to a database-independent application server. Runs on Windows 95, Windows NT, and Solaris. $4995 per developer. http://www.centurasoft. com. Reader service #226.

Choreo 2.0 for Visual Basic 4.0 CenterView Software Inc., S. San Francisco, CA 415-266-7000; 800-424-6736

A client/server development extension for Visual Basic 4.0 that lets developers create high-performance, multiuser applications for Windows NT and 95. Choreo's model-driven data access engine manages all client/server database interactions. Performs data access operations by automatically generating optimized SQL queries at runtime to retrieve and update data. Automatically manages database connections, cursors, queries, logon security, locking, and transactions. Synchronizes the display of data across all forms. The Navigation **Toolbar** provides sophisticated record navigation and search functions with no code. Uses ODBC drivers, using the ODBC API for optimal performance. Additional database drivers support features of Oracle7 and Sybase SQL Server not implemented in ODBC. Reader service #227.

ClientBuilder 4.0 ClientSoft Inc., Tarrytown, NY 914-631-5365; 800-622-2684

A legacy extension and workflow reengineering development toolkit used for building desktop GUIs to host applications, and deploying them on both Windows and Macintosh. Supports Windows, Macintosh, and OS/2 clients accessing mainframe, AS/400, and SQL data sources. Can also be used as middleware (host coupling component) with most Windows-based development tools including Visual Basic, Visual Age, PowerBuilder, and C++. Gives developers a way to use **object** -based, event-driven, fuzzylogic data-stream recognition middleware to reliably integrate other desktop development tools with enterprise-wide, host-based data through its library of proprietary DLLs and DDE links. $12,795 Reader service #228.

CodeServer 5.1 Sequiter Software Inc., Edmonton, Alberta, Canada 403-437-2410

A client/server database development tool for C/C++/Basic programmers. Client applications use regular CodeBase Technology function calls that are named like familiar dBASE commands. Logs each client's action but can also share its data, index, and memo files with concurrently running CA-Clipper, dBASE, and FoxPro programs. A new query optimizer can query a 500,000-record data file in less than one second. Source code is available, and distributing executables is royalty-free. Includes a database server and user's choice of Codebase 5.1, CodeBase++ 5.1, or CodeBasic 5.1.

Included are Codecontrols 2.0, **custom** controls for Windows, and CodeReporter 2.0, a visual Xbase report writer. Client applications can be compiled with all the popular C/C++ compilers and will run under DOS, Windows, Windows NT, and OS/2.$1495. Reader service #229.

CorVision International Software Group, Burlin ton, MA 617-231-1450; 800-765-1474

A repository-based application-server generator that automates the software life cycle and produces both client/server and terminal-host applications that run as Windows clients with OpenVMs and Unix servers. Automatically produces-compiled code for the target system that represents the complete application described by the definitions carried in the repository. This approach enables a joint application development approach and permits immediate deployment and future redeployment in heterogeneous computing environments. Can access data in a variety of relational and nonrelational databases. Reader service #230.

Database Xcessory Integrated Computer Solutions, Cambridge, MA 617-621-0060

An advanced visual development environment featuring a powerful SQL widget toolkit. Lets developers build Motif interfaces that interact directly with relational databases without the need to write X, Motif, or SQL code. The WYSI-WYG user **interface** development environment lets developers build complex C and C++ database applications using drag-and-drop. Applications get their database functionality from a set of Motif-based SQL widgets, which work closely together to generate SQL queries at runtime, pass the queries to a database server, and automatically format the results on the user **interface** . http://www.ics.com. Reader service #231.

DataFlex Data Access Corp., Miami, FL 305-238-0012; 800-451-3539

An application development environment providing developers with an RDBMS and comprehensive **object** -oriented and procedural 4GL in a single tool. Uses its own ISAM-based RDBMS. With the addition of the DataFlex server, users have a scalable system in which the created applications are portable among the supported environments. Available on several Unix platforms Including SCO Unix, 88open Systems, Solaris 1.x and 2.x, IBM AIX, MIPS ABI Compliant and Intel Unix, DOS 386, Windows, and OS/22.1. Reader service #232.

Delphi Client/Server Suite 2.0 Borland International Inc., Scotts Valley, CA 800-233-2444

An advanced developer tool for building and delivering client/server applications. Features data integrity, reuse features, and an intuitive, **object** -oriented **interface** . The suite also includes a two-user copy of Interbase for Windows NT, a SQL database server; a complete set of database design and analysis tools; integrated team development support; and native 32-bit SQL Link drivers licensed for royalty-free deployment on Sybase, Oracle, Informix, Interbase, and SQL Server. The new Delphi 2.0 versions fully support all of the new operating system features of Windows 95 and Windows NT. A new 32-bit-optimized native code compiler provides an increase in performance, and lets developers reuse existing code. New **object** -oriented capabilities for supporting client/server development include a centralized **Object** Repository and new Visual Form Inheritance. http://www.borland. com. Reader service #233.

Developer/2000 Oracle Corp., Redwood Shores, CA 415-506-7000; 800-633-0583

A second generation development tool, delivering features that allow Oracle customers to build applications that can scale from five to 5000 users, from megabytes to gigabytes of data, and from decision support to complex OLTP. Leverages the proven capabilities of Oracle's existing forms, graphics, and report technology. Developer/2000 and Designer/2000, are the first tools to use the same language (PL/SQL) for programming on both client and server. Application partitioning allows portions of an application to be divided between client and server (made possible by Developer/2000's shared language for client and server programming). This technology enhances developer productivity and increases the performance and scalability of any application. $3995 per developer, with free runtime

licenses for deployment on the Windows platform. Motif, Macintosh, and character-mode versions will be available later this year. Reader service #234.

Dynasty 2.0 Dynasty Technologies Inc., Lisle, IL 708-769-8500

An open, scalable, cross-platform development environment based on a comprehensive implementation of **object** -oriented facilities for design, development, and evolution of distributed business objects for enterprise client/server applications. Lets developers build and maintain open, three-tier, distributed applications from a target independent specification. includes automated partitioning capabilities, rapid **object** development facilities, an automated software distribution **interface** , and an intuitive developer **interface** . Supports Windows, Windows NT, OS/2, Macintosh, Solaris, HP-UX, IBM AIX and AIX/ Motif, Oracle7, Sybase System 10, and DB2/2. No ongoing runtime fees. $7995 per developer. Reader service # 235.

Elements Environment Neuron Data Inc., Mountain View, CA 415-321-2238; 800-876-4900

A component-based development environment for building distributed application. The product line comprises six "Elements." Open **Interface** Elements is the GUI builder and includes a comprehensive set of graphical objects, including tables, tree browsers, business graphics, color icons and images, and multifont text. Also lets users add their own **custom** widgets as subclasses of existing widget classes. Data Access Element lets users access a wide range of data sources across multiple platforms and separates the logical view from the physical data source. Intelligent Rules Element lets users add simple or complex business rules to create smart' applications. Distributed Messaging Element is a set of reusable components for developing distributed, "tier-less" applications with partitioned components. Web Element lets users embed the Web's global resources into applications. Includes an embeddable Web Navigator, HTML **browser** , and Navigation API. InterOperable Objects Elements contains ObjectScript Language that allows access to external objects such as OLE objects or any other internal Elements Environment **object** . Available on more than 25 platforms. Pricing starts at $4850. http://www. neurondata.com. Reader service #236.

Empress 4GL/Empress GUI Empress Software Inc., Greenbelt, MD 301-220-1919

Lets users create, modify, ad maintain Empress RDBMS applications. Empress 4GL works in conjunction with Empress RDBMS, letting programmers create screens, incorporate data-integrity checks, define application logic, and develop help prompts and menus. Includes an intelligent application generator, a subsystem that automatically builds screens, establishes default function keys, joins multiple databases and tables into logical views, and allows for the incorporation of basic program logic. Lets programmers call other Empress components and generate operating system commands. Developed under X-Windows and Motif, Empress GUI provides an OO development environment for creating interactive and graphical applications. http://www.empress.com. Reader service #237.

ENFIN Smalltalk 4.1 Easel Corp., Burlington, MA 617-221-2100

A visual Smalltalk development environment. Includes a class **browser** , debugger, workspace, transcript window, and other tools customary of a Smalltalk environment. Enfin extends this base of tools with a visual screen designer, report writer, database administration tools, plus tools for building SQL queries, financial models, and business graphics. Supports a range of connectivity options and access to all major RDBMSs plus EHLLAPI, APPC, TCP/IP, and Named Pipes. System support provided for DDE, DLLs, and OLE. A member of the **Object** Studio family of OO, Smalltalk-based, visual development tools for building large-scale production client/server applications. Reader service #238.

Enterprise Developer 2.5 Symantec Corp., Cupertino, CA 541-334-6054; 800-441-7234

A visual, OO client/server development environment enabling development of scalable applications. Its Enterprise Developer's centralized business model repository and underlying Scale objects enable

developers to create applications with a robust infrastructure without forcing them to code routine transaction logic repeatedly. As the developer builds an application, the Scale **object** leverages the information stored in the business model and enforces transaction logic consistently across any number of applications. Enables simultaneous access to multiple heterogeneous databases. Connections to SQL Server, Sybase, Oracle, DB2, XDB, Watcom, Access, and Lotus Notes are optimized by Scale Data Links. Upgrading to Team Enterprise Developer provides a shared, multiuser business model and development coordination facilities for workgroups. Check-in/check-out facilities, version control, and interfaces to PVCS are provided to support group development. http://www.symantec.com. Reader service #239.

Enterprise Workbench Easel Corp., Burlington, MA 617-221-3000

Consists of an integrated development environment; compilers for Windows, OS/2, and DOS; database tools for creating applications that access industry-standard data sources; and optional tools for enterprise data access and conductivity. Visual design tools include a layout editor for visually organizing an application **interface** ; drawing, text, and menu editors for creating and editing various components of an application; and an attribute editor for defining and editing attributes of various application components. Visual debugging tools include an interactive debugger for executing the application continuously or statement by statement, trace facilities for visually monitoring program execution, and stack windows for viewing response block, action routines, and tines. Provides full 32-bit support as will as strings, arrays, and structures limited in size only by available system memory. Reader service #240.

Exsys Professional 5.0 Expert System Development Software Exsys Inc., Albuquerque, NM 505-256-8356; 800-676-8356

For developing probabilistic, knowledge-based expert systems using If-Then-Else production rules. Generic hooks allow invisible imbedding and easy interfacing to other applications, databases, and process-control software. Complete portability across platforms. A Rule Editor enables rapid generation via help screens for selecting items from lists of various options. Rules can be created and edited easily. The Command language provides greater control and flexibility using subsets, looping and conditions tests. The ExDesign program provides customization of screens with detailed, automated graphics, meters, list boxes, or templates. Interfaces into spreadsheets and ODBC/SQL databases, neural networks, laser disk, LINDO linear programming, process-control plant information systems, and more. Fuzzy logic for handling imprecise data. Includes unlimited run-time license for distribution of completed applications. Platforms: Windows, Windows NT, Macintosh, Unix, OS/2, VAX, HP, Solaris, DOS, and others. Pricing starts at $2900. http:// www.nm.org/exsys. Reader service #241.

FlowBuilder PowerCerv Corp., Tampa, FL 813-226-2600

A workflow-enabling developer's tool designed to help build workflow logic so that it is maintained as a reusable component, separate from the application. Lets developers build applications with workflow logic so that changes to the application are made to either the workflow engine, the applications **interface** , or the data access. Status information can also be used for decision branching in later steps of the task. Tasks are able to queue (schedule) other tasks that may or may not be assigned to the individual performing the task. Task convergence is provided so that work performed by diverse groups can be converged and assigned for completion after all the converging tasks are completed, and task rendezvous is provided so that a task can be scheduled for completion after a particular event has occurred. http://www. powercerv.com. Reader office #242.

Focus Information Builders Inc., Now York, NY 212-736-4433; 800-969-4636

A family of enterprise-wide data access and reporting tools for any platform. The mainframe and midrange system versions include a sophisticated data file maintenance tool that supports set-based, record-at-a-time, event-driven processing, and improved transaction-integrity features. This facility also supports remote calls, allowing data and applications to be distributed over different processors.

The Windows version (the Focus Six family of products) provides tools for
end-user reporting, adding maintenance to applications; building
decision-support applications and managing ad hoc access; distributing
reports through e-mail and offloading production; and multiuser updating of
Focus databases. A client/server connectivity product, Focus Personal
Agent, lets host-based Focus systems function as servers in client/server
operation with Focus Six clients. Focus versions are available for IBM VM,
MVS, OS/400, DOS, windows, OS(2, DEC/VAX, Wang VS, HP, Tandem, Bull, and
more than 20 Unix processors and RDBMSs. 395-$194,000, depending on
platform. http:// www.ibi.com. Reader service #243.
    Focus Six for Windows Professional Developer's Kit Information
Builders Inc., New York, NY 212-736-4433; 800-969-4636
    An **object** -based development tool for creating decision-support
runtime applications. A technical administrator can set up the data rules,
package them, and distribute them to users. This simplifies data access by
creating a predefined environment of data objects, filters, and user
shells. Users can build Windows applications with objects-based tools for
developing forms, reports, and 3D graphics, and they can create standalone
and client/server applications with bundled interfaces to popular file
formats and databases, whether local or remote. An Application Packager
allows installation of scripts, compression, and deployment of
applications. Users can manage applications with an **Object** **Browser** that
manipulates application components by displaying components graphically,
showing dependencies, hierarchies, and parentchild relationships. $3495;
Power Edition without runtimes: $795.http://www.ibi.com. Reader service
#244.
    Forte Application Environment Forte Software Inc., Oakland, CA
510-869-3400
    Enhances the speed of application development, improves completed
applications' quality, and enables reliable operations in heterogeneous
distributed computing environments. Lets organizations build applications
for functions such as customer service, supporting up to hundreds or
thousands of online users. During development, applications are built
independen of their target computing platforms. In production, it
automatically implements strategies for high reliability without additional
coding, including component failure recovery, load balancing, transaction
integrity, and version checking of distributed components. $4000-$6000 per
developer and $200-$750 per user. Basic package consisting of a five-user
development system, repository, **interface** to one GUI, **interface** to one
relational database, and 10 runtime licenses: $75,000. Reader service #245.
    Gamelon Menai Corp., Menlo Park, CA 415-853-6450
    A file I/O library that reduces programming time at the data storage
level through pre-written code modules that simplify how structured data
files are created, written, and read. Turns every kind of data or file into
an **object** , enabling persistent storage and access to data in complex
relationships. Has many of the capabilities of a complex database,
including **object** nesting, cross-referencing, indexing, transaction
management, automatic **object** tracking, and platform-independent,
type-safe data storage. The same file-access routines can be used with
various computer languages and operating systems: supports Windows 3.1,
Windows NT, Windows 95, OS(2 2.X, OS(2 3.0 Warp, Sun-OS, Solaris, and
Linux; and supports multiple languages including C, C++, and Visual Basic,
with interfaces to Pascal/**Object** Pascal and Cobol/**Object** Cobol. Also
supports Unicode the international communications coding standard. Reader
service #246.
    Illustra Client Toolkit for Windows Illustra Information Technologies
Inc., Oakland, CA 510-652-8000
    Illustra tools native to Windows NT for rapid application developmetn.
Tools include Illustra Query, enabling development and debugging using ad
hoc SQL queries rather than API language, and the Visual basic **interface**
for accessing the Illustra server from VB rather than prototypes in C/C++.
Runs on Windows NT. http://www.illustra.com. Reader service #247.
    Informix NewEra Viewpoint Pro Informix Software Inc., Menlo Park, CA
415-926-6300; 800-331-1763

A suite of graphical development tools that provide a codeless development environment for creating small- to mid-sized database applications for both data-entry and access purposes. Features a graphical form painter, report writer, and application screen builder for creating user-menu systems), as well as a database schema builder, SQL editor, and "Super View" builder (for creating highly specialized views to the database that simplify the access, retrieval, and analysis of data from relational databases). Each component is integrated with an intuitive, mouse-driven environment that lets users develop graphical applications without writing code. Available on Windows. Reader service #249.

Informix NewEra Informix Software Inc., Menlo Park, CA 415-926-6300; 800-331-1763

An open, graphical, OO development environment designed for creating client/server applications. Offers a set of next-generation features that include: productive visual programming tools, a powerful and flexible database application language, support for team-oriented development, and a framework for code/component reuse -- all within a client/server-ready package that supports open connectivity to non-Informix relational databases. Available on Windows. Reader service #248.

Intersolv DataDirect Developer's Toolkit v2. 10 Intersolv Inc., Rockville, MD 800-876-3101

A high-level API that provides DMS-independent access, query, and data handling functions to build ODBC-compliant SQL applications. Includes ODBC-compliant drivers and is compatible with all development environments. Supports HP-Allbase, Btrieve, CA-Clipper, DB2, DB2/2, DB2/6000, DBASE, Excel, Foxbase, FoxPro, Gupta SQLBase, HP-Image/SQL, Informix, InterBase, Microsoft SQL Server, NetWare SQL, Oracle, Paradox, Progress, SQL/400, SQL/DS, Sybase System 10, Teradata, text files, and XDB. Available for Windows 3.1, Windows 95, Windows NT, OS/2, HP-UX, IBM AIX, Solaris, and Macintosh. (Not all DBMSs are available on all platforms and some may require a gateway. $699 (multiuser licensing available). http://www.intersolv.com. Reader service #250.

ISE Eiffel Interactive Software Engineering Inc., Santa Barbara, CA 805-685-1006

An advanced, OO visual development environment for large-scale multiplatform software development. Provides an integrated suite of OO tools for development, GUI building, CASE, database, and client/server, with cross-development of runtime and GUI support for all Unix and Windows variants, VMS, IBM S/390 MVS, OS/2, and more. Components include: EiffelBench visual workbench with incremental compiler/interpreter, debugging and browsing tools, cross-development, generation of portable C code, and interfaces with existing C/C++ code: EiffelVision class library for the development of portable graphical applications and user interfaces; EiffelBuild interactive application builder with graphical model for attaching actions to widgets; EiffelBase basic class libraries; EiffelNet client/server application library; EiffelStore class library relational and OO DBMS database access; EiffelCase analysis, design, and reverse-engineering tools; EiffelMath numerical library; and EiffelShelf reusable components from third parties, for 3D graphics, banking, finance, and accounting. http://www.eiffel.com. Reader service #251.

JAM 7 JYACC Inc., New York, NY 212-267-7722; 800-458-3313

A cross-platform tool for building client/server and three-tier enterprise applications. Provides a scalable solution that spans standalone, client/ server, and three-tier application architectures; desktop to mainframe platforms; departmental through enterprise-wide information systems; standalone development through large development teams; interactive and batch/report applications; and RAD through repository-driven and structured CASE methodologies. Applications can run unmodified on a wide range of platforms and operating environments, including Windows, Windows 95, Windows NT, Motif, OS/2 Warp, Macintosh, VAX/VMS, and most implementations of Unix. Also integrates seamlessly with a broad spectrum of RDBMS products, and provides transparent access to legacy systems via DRDA and ODBC. Pricing starts at 2400 per developer, with no runtimes. http:// www.jyacc.com. Reader service $252

Lansa/AD Lansa USA Inc., Oakbrook, IL 800-245-2672

An AS/400-based application development and maintenance tool that provides a complete application-development environment, including test and debug facilities, documenter, and change control. Source definitions are written in RDML (Rapid Development and Maintenance Language), Lansa's 4GL. No knowledge of any 3GL is required, because all development and debugging is at the RDML level. Applications are easily converted to client/server mode, as RDML is used for both client and server development. Lansa applications can be ported to OS/2, IBM AIX,. and Windows platforms. http:// www.lansa.aspect.com.au. Reader service #253.

Lansa/CS400 Lansa USA Inc., Oakbrook, IL 800-245-2672

A toolset for creating and maintaining client/ server of AS/400-based applications. Either attached or detached from the AS(400, on a standalone PC or LAN, the user has a complete development environment including compile, test, and debug facilities. The active repository stores data definitions, business rules, data validations, help text, error messages, triggers, and multilingual definitions. Changes to repository factors are made once and are then used by all related programs. High-speed middleware accesses multiple databases, even if they're spread across AS(400 and PCs. The applications can be executed over OS/2, Windows, OS/400, or IBM AIX platforms without the need to change any code. http://www.law.aspect.com. au. Reader service # 254.

Layout Objects Inc., Danvers, MA 800-424-6644

An advanced OO application development system for building applications without using a traditional computer language. The user manipulates actual on-screen objects to create a diagram representing the program. Layout then creates ready-to-run.exe files or programs in C, C++, Pascal, or Basic from the diagram. The architecture is designed to use existing C, C++, Pascal, Basic, or Assembly language code and turn it into reusable Layout objects. Cross-platform compatibility allows programs to be created on Windows, DOS, Windows NT, and Windows 95. Features an **object toolbar** , an OO database system, networking support, automatic multilevel indexing, query-by-example searches, snap-to-fit card designs to automatically change existing database formats, and built-in record-and file-locking capabilities. Available in DOS, Windows, and Windows 95. $299.95. http:// www.objectsinc.com. Reader service #255.

Level 5 **Object** Professional Information Builders Inc., New York, NY 212-736-4433; 800-969-4636

A workbench for developing components for client/server applications that provides developers with the capability to build and deploy intelligent software agents that can be embedded in other applications, called from off-the-shelf programs, or run over a LAN and distributed across an organization with no runtime site license fees. Users can add intelligence to client/server applications as small, efficient, and smart agents. Agents can enforce business rules, provide smart help and advice, manage complex document handling, or diagnose critical business problems. Captures and codifies valuable expertise in the form of objects, business rules, triggers, and smart forms. The user's business knowledge is delivered as an OLE 2.0 automation server, so it can be accessed from anywhere within any Windows application. http://www.ibi.com. Reader service #256.

Lotus Notes ViP for Windows Lotus Development Corp., Cambridge, MA 617-577-8500; 800-346-1305

A visual application development environment that combines the power of Lotus Notes with Visual Linking tools, enabling corporate developers, and ISVs to build strategic groupware applications that extend Notes to new applications and new users. Extends Notes in four key areas: query and update of relational and Notes databases; programmability and extensibility via LotusScript; reporting and charting; and sophisticated GUI creation. Contains both a designer component, which lets developers build Notes applications, and a runtime, which allows Notes users to run Notes Vip applications. $955. Runtime version is also available at no charge for all licensed Notes workstations. Reader service #237.

Magic 6.0 Magic Software Enterprises Inc., Irvine, CA 714-250-1718; 800-345-6244

A table-driven application development tool for client/server and host

systems. Integrates prototyping, development, modification, enhancement, and maintenance in one tool. Platform-and RDBMS-independent ports to new platforms or adds an RDBMS with no additional programming. Scalable, supports the three-tier client/server model and application partitioning, and allows client/server migration leveraging legacy data and hardware including terminals. Supports Oracle, Sybase, Microsoft SQL Server, Informix, Rdb, RMS, Ca-OpenIngres, DB2/400, DB2/6000, Xbase, Btrieve, Micro Focus Cobol, C-ISAM, and c-tree. Runs on Windows, DOS, Novell Netware NLM, SCO Unix, IBM AS(400, IBM RS(6000 (AIX), Digital Alpha and VAX, SunOS and Solans 2, HP-9000 (HP-UX), AT&T GIS System 3000, and Data General Aviion. http://www.magic-sw.com. Reader service #258.

　　MainWin Studio Mainsaft Corp., Sunnyvale, CA 408-774-3400; 800-624-6946

　　A Windows-based cross-platform development environment. Leverages multiple source-code licenses from Microsoft to address the major challenges of cross-platform development, offering Microsoft solutions for testing (MainWin Test), version control (Visual SourceSafe for Unix), online documentation and help, as well as the Windows API (MainWin XDE) on major Unix platforms. MainWin XDE (Extended Development Environment) lets software developers extend their Windows source code, resource files, and help files to Sun, HP, IBM, Digital, SGI, and SCO platforms. Reduces Windows application deployment time, while ensuring future cross-platform independence by virtue of the MainWin library. MainWin Test 3.0 for Unix platforms offers compatibility with Microsoft Test for the PC, in both test script development and execution. Allows the reuse of the same testing scripts created during development on Windows. Visual SourceSafe for Unix is a project-oriented version-control system that is cross-platform compatible with Microsoft Visual SourceSafe for the PC and Macintosh. http:// www.mainsoft.com. Reader service #259.

　　Micro Focus Workbench 4.0 Micro Focus Inc., Palo Alta, CA 415-856-4161; 800-872-6265

　　Streamlines the workflow during the edit-test-debug development or maintenance cycle. Gives application developers the tools to develop and maintain applications for IBM mainframes, Windows OS/2, and a wide range of Unix (and other open systems platforms), or combinations of platforms in a client/server environment. $2500. http://www.microfocus.com. Reader service #260.

　　Microsoft Visual Basic Microsoft Corp., Redmond, WA 800-426-9400

　　A programming system that solves development problems. Extends applications, workgroup data flow, client/server development, or executive information systems. Provides a flexible programming language, access to data, and component reusability. Provides a visual way to create a user **interface** by assembling prebuilt components. Features also include a syntax-checking editor and sophisticated debugging tools. Provides the ability to use commercial applications as components in users' applications. Available in standard and professional editions, and supports many data formats through a built-in database engine, including Microsoft and Sybase SQL Server, Oracle and ODBC. Visual controls are used for no-code data access, or in the professional edition, a programmatic layer is used for complete control over data access. Commercial applications are integrated into projects with OLE Automation. professional edition: $339; standard edition: $99. Reader service #261.

　　Mosaic Bridge Thundentone/Expansion Programs Int'l. Inc., Cleveland, OH 216-631-8544

　　Lets customers link the database dexterity of Thunderstone's Texis with the online forms support found in the Mosaic World Wide Web **browser** . This combination lets users create globally distributable information services via the **Internet** . Translates a Mosaic-submitted HTML form into a SQL query processed by Texis. it then converts the data retrieved by Texis into HTML format and sends it back to the Mosaic server. This entire process is invisible to the user. With Mosaic Bridge, customers can create a centralized database with world-wide access without having to reformat a database or manually convert the data into HTML format. Support for query, insert, and update transactions; user-specified input forms and HTML report formats; hyperlink result sets; dynamic form creation; multimedia objects;

and parallel and multiple-server queries. 1200. http://www.
thunderstone.com. Reader service #262.
    NEWT SDK 5.0 NetManage Inc., Cupertino, CA 408-973-7171
    Application development environment that provides a choice of C and
VBX interfaces, plus a WinSock C++ class library. Gives users access to
WinSock, WinISDN, WinSNMP, WinCGI, RPC, ICMP, TCP/IP, MAC, UDP, FTP,
POP2/3, and SMTP. There are modem APIs and terminal emulation APIs for
ATERM, EHLLAPI, HLLAPI, and WINHLLAPI. Applications using the produces APIS
can be used on any Winsock 1.1-compliant protocol stack. Provides C, C++,
and Visual Basic samples. Supports 32-bit APIs for all APIs except WinSNMP,
SNMP, and SMTP. A NEWTTrace application is included for debugging purposes.
Royalty-free runtime license on most APIs. Available on CD. Supports
Microsoft C 5.1 or later, Microsoft Visual C++ 4.0, Borland C++, and
Microsoft Visual Basic 3.x or later. Requires Windows 3.0 SDK, DOS 3.1 or
later, Windows 95, or Windows NT 3.51. Supports IBM PC, XT, AT,
386/486/586, or compatible. $500. http://www.netmanage.com. Reader service
#263.
    Nomad 6.0 Thomson Software Products Inc., Norwalk, CT 800-441-6878
    A 4GL used for application development and reporting. When used with
Front & Center for Reporting as a reporting front end, and with either
ODB/Server or RR/Server, Nomad is a mainframe server. Runs on IBM and
compatible mainframes and midrange platforms. Combines an integrated
nonprocedural and procedural language with facilities for data definition,
management, and reporting. Relational in architecture, it efficiently uses
other relational engines, generating SQL statements and offloading as much
work as possible to the engine. Sorting, aggregations, and joins are passed
to the database optimizer wherever appropriate, conserving machine
resources and minimizing network traffic in client/server implementations.
Mainframe Nomad accesses a variety of leading VM and MVS databases and file
structures, including DB2, SQL/DS, IMS, IDMS, Teradata DBC/1012, QSAM, and
VSAM. The Nomad family of products includes: QList, a Nomad tool that lets
mainframe business users access and use mainframe data with a
point-and-click **interface** ; OnePass, a facility that helps decrease
production reporting costs; NAPA, an application performance analyzer; and
a DB2 resource governor that allows sites to control user resource
consumption. http:/www.thomsoft.com. Reader service #264.
    Object Master ACI US Inc., Cupertino, CA 408-252-4444; 800-881-3466
    A programming environment that provides all the necessary tools to
write, organize, and navigate through source code. Provide access to
information, editing capabilities, and navigation through projects. The
environment is dynamic; developers can immediately see the effects of
changes made to code without having to recompile. Parses source files
listed in the project and creates a data dictionary that tracks each
function, procedure, class, structure, and so on. Works with procedural as
well as OO languages. Available for Power Macintosh, Macintosh, and Windows
3.1, 95, and NT. Both 16-bit and 32-bit versions are available. Programmers
can use the same project interchangeably on both platforms. Supports C and
C++ programming languages and works seamlessly with all major compilation
systems. http://www.aci-4D.com. Reader service #265.
    Object Studio Easel Corp., Burlington, MA 617-221-2100; 800-625-3287
    A family of OO visual development tools for building large-scale
production client/server applications. Based on Smalltalk, **Object** Studio
supports a rapid application development model while leverazing the **object**
 technology benefits of scalability and maintainabihty. For large
organizations that need to build complex applications that can be ported
across multiple hardware and software platforms. includes Enfin Smalltalk,
Synchronicity, and TeamBuilder. Enfin Smalltalk is an enhanced Smalltalk
development environment that provides a class **browser** , workspace,
debugger, and a transcript window. Enfin also includes a screen designer,
report writer, database connectivity, administrative tools, and tools for
financial modeling and business graphics. Enfin also supports a wide range
of connectivity options. Synchronicity is a set of tools for designing and
managing business objects. Synchronicity provides a Business **Object**
Modeling tool for visually designing objects that mirror a business

process. Synchronicity also provides a Persistent **Object** Mapping tool to map **object** -oriented models to relational databases visually. TeamBuilder enables groups of developers to build **object** -oriented applications simultaneously. Prices start at $2995. Reader service #266.

ObjectCatalog ObjectSpace Inc., Dallas, TX 214-934-2496; 800-625-3281

Facilitates asset reuse by providing a way to classify and search for assets within an organization. (Assets are applications, design patterns, frameworks, classes, documentation, or any other items for reuse.) Catalogs the available assets in an organization; each asset is represented by an entry that contains information about the asset, such as its contents and location. Using the search facility, users can electronically search the catalog for assets they can reuse. Available on most development platforms, including Windows, Windows for Workgroups, Windows NT, Windows 95, HP-UX, OS/2, Solaris, and SunOS. $8500 per server; 375-$775 per client license, depending on the volume. http://www. objectspace.com. Reader service #267.

ObjectIQ Hitachi America Ltd., New York, NY 212-751-6302; 800-558-1413

An OO, rapid-application development environment complete OOP facilities. In addition to providing OO programming, ObjectIQ allows development of client/server applications based on DCE remote procedure calls. Interfaces with many popular RDBMSs (Oracle, Sybase, Informix, and CA-Ingres) and runs on IBM RS/6000, HP 9000, and Sun SPARC. Support for ObjectStore and OpenODB (**object** DBMSs) is an integral part of ObjectIQ. Pricing is $3000 per development seat. Reader service #268.

ObjectPro 1.0 Platinum Technology Inc., Oakbrook Terrace, IL 800-4426861

An OO development tool, which is a member of Platinum Technology's Application Lifecycle Solutions family of products. Deploys fully compiled executables through the generation of C and C++ code. Supports inheritance, specialization, and encapsulation throughout an application. It is a fully visual programming environment and contains tools for creating screens and database queries. Supports Oracle, Sybase, Informix, and SQL Server through native interfaces. Supports other databases through ODBC. Runs on Windows 3.1, Windows 95, Windows NT, HP-UX, IBM AIX, and Solaris. http://www. platinum.com. Reader service #269.

ObjectReuser 1.0 Hitachi America Ltd., New York, NY 212-751-6302; 800-558-1413

Facilitates software reuse by letting developers quickly locate and implement C, C++, and ObjectIQ objects applicable to a particular project. This is accomplished though the use of a powerful online prospector. Available for IBM RS/6000, HP 9000, and Sun SPARC platforms. $1500 per user. Reader service #270.

ObjectStart 4.0 Greenbrier & Russel Inc., Schaumburg, IL 708-706-4000; 800-453-0347

A comprehensive PowerBuilder **object** toolkit that reduces development time, lowers the overall cost of application development, and promotes consistent adherence to development standards. Key features include a framework for developing multiple document **interface** applications, mechanisms for content-based navigation, a set of fully reusable graphical controls, and a flexible-security **object** . Other features include: added graphical controls (2D and 3D tab controls, hierarchy outline control, progress bar, status window, and splash window), an enhanced demo application, expanded application generator, and documentation, and reference manuals. Also includes EZPaint Windows, a collection of ready-made windows complete with DataWindows and other controls for rapid application construction. Reader service #271.

Omnis Blyth Software, Foster City, CA 415-571-0222; 800-346-6647

A component application development environment for developing, deploying, and maintaining workgroup, departmental and large-scale client/server systems. Users can develop on any supported platform and deploy on Windows NT, 95, or 3.1, Macintosh, Power Macintosh, OS/2, and Unix. Features include application prototyping and development version control, automatic deployment, change management, modeless development, cross-platform support, integration of SQL and legacy databases, a debugger, and comprehensive graphics. Supports Oracle, Sybase, DB2, and

more than 45 other databases. The basic Workgroup Edition includes a single-seat developer license and a 10-user database deployment license. $495. http:// www.blyth.com. Reader service #272.

OpenScape Business@Web, Inc., Cambridge, MA 617-876-0038; 800-700-8598

A component-based development environment that spans corporate Intranets, the enterprise, and the **Internet** . Lets developers create reusable software components (both visual and logical) that are easily assembled to create: GUI-based client/server applications; dynamic workflow applications integrating familiar desktop products; and secure, graphical Web applications. Components are: 1) Web objects that can be embedded in Netscape pages and automatically distributed over the **Internet** , and 2) OCXs that can be reused in any OLE-enabled desktop application. Components can securely access enterprise systems and legacy data over the **Internet** without HTTP or CGI scripts. Uses a three-tiered client/server architecture to integrate enterprisewide data from relational sources and legacy systems. The benefits of this architecture include server load balancing, application fault tolerance, and support for high-transaction systems. Applications can integrate industry standards such as ODBC, DCE and CORBA, as well as enterprise system such as SAP. http:/www. busweb.com. Reader service #273.

Oracle Power Objects Oracle Corp., Redwood Shores, CA 415-506-7000

Part of the Oracle Workgroup/2000 product family, this is a graphical, **object** - based development tool that enables the rapid creation of client/server applications by combining point-and-click objects with drag-and-drop facilities. Supports cross-platform application development. Applications developed with this tool can run on Windows, Macintosh, and OS/2. Compatible with Macintosh System 7.5 and Microsoft Windows 3.1, and is Windows 95-ready. $399 per developer. Available for Windows, Macintosh, and OS/2. An OS/2 version will be available in the third quarter of 1995. A client/server version is available for $1999. http://www.oracle. com. Reader service #274.

PADLock PowerCerv Corp., Tampa, FL 813-226-2600

Provides graphical and context-sensitive security administration that allows security-privileged end users to secure objects such as windows, buttons, and DataWindows in their PowerBuilder applications. Key features include: graphical security administration, and integration with PowerCerv tools including PowerTool and FlowBuilder; security distinctions over objects such as editable or read-only, visible or invisible, and enabled or disabled; graphical administration and comprehensive text-based administration; security to the **object** level including DataWindows, DataWindow columns, rows, and fields; user objects; buttons; windows, and menus. Supports most major RDBMSs, and is class library-independent. http:// www.powercerv.com. Reader service $275.

Parts Wrapper for Relational Databases ParcPlace-Digitalk, Sunnyvale, CA 408-481-9090; 800-759-7272 Lets Visual Smalltalk developers **interface** with leading SQL databases. Developers can build database applications by clicking and dragging. Supports transactions, stored procedures, and building reports. Lets users create graphical front-end applications that work independently of the database they access. Using the Visual Smalltalk and Parts technology, users can create intelligent database accessor parts using SQL Others in an organization can assemble applications from these parts with no knowledge of SQL, the underlying database structure, or the database connections. Parts technology is open, extensible, and language-neutral. Add-on products are available from ParcPlace-Digitalk and third-party developers. http://www.parcplace. com. Reader service #276.

Platinum RuleServer Platinum Technology Inc., Oakbrook Terrace, IL 800-442-6861

The server runtime for knowledgebases built with Platinum AionDS. Enables a three-tier client/server architecture. A member of Platinum Technology's Application Lifecycle Solutions family of products. Lets users extend the business logic of existing applications, and create new distributed business applications. Addresses the need to create or extend applications with business rules, and deploy these applications in a high-performance, multiuser, client/ server environment. Runs on Windows

NT, OS/2, HP-UX, IBM AIX, and Solaris. http:// www.platinum.com Reader service #277.

Power Expert AJJA Information Technology Consultants Inc., Ottawa, ON 613-563-2552; 800-665-0823

Helps users identify the most effective PowerBuilder development process to accelerate client/server development and the construction of durable and robust applications that respond to a proven set of standards. Consists of standards, procedures, guidelines, and reusable **object** libraries. Designed for both new and experienced PowerBuilder developers. Provides immediate **object** assembly. $495. Reader service #278.

PowerBuilder Desktop 4.0 for Windows Powersoft Corp. (a Sybase company), Concord, MA 508-287-1994; 800-395-3525

A comprehensive, single-developer environment for building Windows 3.1 client/server applications. Its OO design and ODBC 2.0 connectivity to popular desktop databases let developers create Windows applications with support for multiple document interfaces, drag and drop, DDE, and OLE 2.0. Comes with a single-user,-built-in Watcom 32-bit relational database that can be upgraded to Watcom Advanced Network Servers. For enhanced developer productivity, Powersoft offers a variety of companion products that expand PowerBuilder Desktop's capabilities. $695. Reader service #279.

PowerBuilder Enterprise 4.0 for Windows Powersoft Corp. (a Sybase company), Concord, MA 508-287-1500; 800-395-3525

A comprehensive development environment for building Windows-based client/server applications. combines intuitive graphical painters with an extensible OO programming language in an integrated package. PowerBuilder Enterprise features broad Enterprise connectivity, with native support for leading client/server databases. For large team development, PowerBuilder Enterprise includes a centralized **object** library/source manager, an application configuration manager, and interfaces to leading version-control technologies. Reader service #280.

PowerHouse Cognos Inc., Ottawa, ON, Canada 617-229-6600; 800-426-4667 A Windows- and Macintosh-based development environment for building enterprise applications with relational databases. Offers a server-based application development tool that allows business-critical programs to be written and modified easily. Covers all stages of the application life cycle and includes RDBMSs. A specification-based language, PowerHouse provides flexible production reporting capabilities, volume processes, and interactive screens and menus. Offers a set of automated application models that create fully functional applications with minimal coding. Server-based Powerhouse 4GL is available on OpenVMS (VAX & Alpha), OSF/I (Alpha), IBM OS/400, IBM AIX, MPEHX, MPE V, HP-UX, Solaris 2.x, DG/UX, and SCO Unix. Reader service #281.

Powerhouse Client Cognos Inc., Ottawa, ON, Canada 617-229-6600; 800-426-4667

Provides an Intel/Microsoft Windows or Macintosh GUI for the server-based Powerhouse 4GL. Uses a server-based repository to support Windows, Macintosh, and character-based terminals with the same application. Powerhouse 4GL Server controls application processing and access. The Powerhouse Client Designer is a Windows-based forms design tool that provides drawing tools to **customize** the application **interface** . Powerhouse Client runtime is available for both Windows and Macintosh environments. Available on OpenVMS (VAX and Alpha), OSF/1 (Alpha), IBM AIX, MPE/iX, HP-UX, Solaris 2.x, DG/UK, and SCO Unix. Power-House Client runs on Windows 3.1 and Apple System 7 or later. Reader service #282.

Progress version 8 Progress Software Corp., Bedford, MA 617-280-4000; 800-471-6473

A component-based application development environment that harnesses OO technologies to enable users to maximize productivity and business benefits. Using the new SmartObject technology and Application Component Environment (ACE), developers can build reusable components and assemble them into enterprise-level applications that are scalable, portable, and reconfigurable across heterogeneous client/server and host-based environments. The Progress Application Development Environment (ADE) lets developers build enterprise client/server applications that can be deployed with Oracle, Sybase, DB2/400, NT SQL Server, and Progress

databases. Reader service #283.

ProtoGen+Client/Server Suite ProtoView Development Corp., Cranbury, NJ 609-655-5000

An integrated toolset that lets users visually construct desktop or client/server database applications and generate 16- or 32-bit code. Includes WinControl Library of data-entry controls, DataTable high-performance data-aware grid component, team development and integration to version-control software, more than 25 Intersolv database drivers for desktop and SQL databases, Protoview Visual Help Builder, PICS, Crystal Reports pro with Report Writer Visual Coder, and Graphics Server with Graphic Server Visual Coder. Available for Windows, Windows 95, and Windows NT. $1999. http://www.protoview.com. Reader service #284.

Rational Apex Rational Software Corp., Santa Clara, CA 408-496-3600; 800-728-1212

An integrated environment for designing, developing, and maintaining complex applications. Lets users express and enforce their software architecture; provides configuration management, version control, and system build/release capabilities; includes a production-quality compiler and debugger, language-sensitive editor, and program **browser** ; and lets users enforce coding rules automatically. Rational Apex is the centerpiece of -- and works with -- an extensive family of Rational software support tools, including Rational Rose (graphical OO programming), SoDA (software document automation), and TestMate (software testing automation). http://www.rational.com. Reader service #285.

Recital 7.3 Recital Corp., Danvers, MA 800-873-7443

An open systems database manager that allows a flow of information among databases, operating systems, and platforms. Maintains users- **interface** independence, which permits customers to run applications on a range of character-cell and GUI-based systems interfaces. It shareware and operating system independence lets programmers develop cross-platform applications on their system of choice, and deploy applications where they're needed. Also offers application migration of FoxPro, CA-Clipper, or dBASE IV applications. Processes data residing on host-based, file server-based, and client/server-based systems on Oracle, CA-OpenIngres, Sybase, Informix, and DB2/6000. http://www.recital.com. Reader service #286.

RPCpainter Greenbrier & Russel Inc., Schaumburg, IL 708-706-4000; 800-453-0347

An integration framework linking PowerBuilder with Open Environment Corp.'s three-tier development tools. This architecture overcomes the scalability problems of traditional two-tier client/server environments by using standard RPC technology. This allows business logic to be implemented in server procedures using languages such as Cobol, C, and C++. Functions include: a graphical tool for preparing and editing remote procedure **interface** definitions, automatic generatithe server, automatic generation of RPC objects in a PowerBuilder Library for the client, and automatic generation of DataWindows for population with RPC results. Reader service #287.

SAS System, The SAS Institute Inc., Cary, NC 919-677-8000

Provides tools to access, manage, analyze, and present data for a variety of applications across a range of computing environments, from mainframes to microcomputers. Capabilities include EIS, data warehousing, graphics, data analysis, report writing, quality improvement, project management, computer performance evaluation, client/server computing, database access, decision support, and application development. Base SAS, the foundation of the SAS system, includes a 4GL and ready-to-use called procedures. SAS/Assist is a menu-driven **interface** to many of the SAS tools. SAS/Connect is a cooperative-processing product that lets local SAS sessions establish a conversation between two SAS sessions, giving users the ability to transfer data among sessions and across hardware platforms. SAS/Access is a family of more than S5 individual interfaces on 15 different platforms that provides direct and transparent read-and-write access to various databases, including DB2, SQU DS, IMS, DB2/2, AS/400, Oracle, RDB/VMS, CA-Datacom, CA-OpenIngres, Informix, ODBC, Sybase SQL Server, Microsoft SQL Server, Adabas, and SAS's System 2000. Runs on: IBM

370/390 architecture running MVS, CMS, or VSE; Prime 50; DG Eclipse MV;
Digital VAX running Primos, AOS/VS, or OpenVMS/AXP; IBM PC running OS/2,
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800-444-8782
A client/server development system based on QuickObjects. Lets users
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STAR:Flashpoint Sterling Software Frontware Division, Redwood City, CA
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A client/server integration tool that helps users take advantage of
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object -oriented, Smalltalk-based, visual development tools. Reader service #294.

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Enables groups of developers to build 00 applications simultaneously. Developers can group objects together as a project, with each **object** having a separate revision level, date stamp, and label. Integrated with Intersolv's PVCS product, it provides additional functionality, including archiving older classes and files, comparisons among revisions, and labeling. A member of the **Object** Studio family of **object** -oriented, Smalltalk-based, visual development tools for building large-scale production client/server applications. Reader service #295.

TeamConnection IBM Software Solutions, Somers, NY 520-574-4600; 800-426-3333

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Uniface Six Compuware Corp., Farmington Hills, MI 810-737-7300; 800-365-3608

A client/server application development environment that provides model-driven, repository-based development and technology-independent deployment. Incorporates a component-based architecture, and consists of five integrated work-benches that share information from an application objects repository: the Application Model Manager for creating and maintaining the application model; Rapid Application Builder for the graphical creation of forms and reports; Deployment Manager, which incorporates a system of native database drivers for transparent database access, application partitioning facilities, and distributed processing through interfaces to transaction processing monitors and remote procedure calls (provides access to more than 30 DBMSs and file management systems, including DB2, DB2/2, DB2/6000, Oracle Rdb, RMS, CA-OpenIngres, Sybase, Informix, Oracle, dBASE III, Microsoft SQL Server, HP TurboImage, and HP Allbase/SQL); Developer Series for managing team development with version control and access privilege facilities; and Personal Series, which is used to query, build, report, and transfer data into desktop applications. $5000 per developer. http://www.compuware.com.Reader service #298.

Unify Vision 2.0 Unify Corp., Sacramento, CA 916-928-6400

Provides a single, integrated solution for the development, deployment, and ongoing management of complex distributed applications. Features scalable rapid application development and deployment and automated application partitioning. Users can build production applications that solve business-critical needs such as order processing, inventory

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A family of graphical database tools that run on top of UniSQL/X and UniSQL/M. These GUI-based tools let application developers generate GUI front ends Co-database applications, visualize database schemas and contents, and design and generate complex reports. Reduces the complexities of **object** -oriented data modeling, and helps developers build applications that integrate multimedia data. ObjectMaster is a GUI application generator, which lets users develop GUI applications without using a host programming language. VisualEditor is a graphical database design tool for browsing, designing, and editing the UNISQL database schema and database contents. MediaMaster is a graphical tool for designing report templates, managing them, and generating reports by filing the templates with data retrieved from UniSQL/M or other database systems. Works with database systems such as EDA/SQL, CA-OpenIngres, Oracle, Sybase, UniSQL/X and UniSQL/M, and Versant. Runs on Sun SPARCstation or SPARC compatible, HP 9000, IBM RS/6000, Digital Alpha AXP, and Windows NT. Pricing starts at $795. Reader service #300.

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Gives developers a model-driven application development environment that automatically generates Smalltalk-based GUI applications rom **object** models defined with Rumbaugh OMT. Automatically generates and evolves the database schema for the Versant ODBMS, and provides access to relational databases through the ParcPlace-Digitalk ObjectLens. Supports team development with integrated support for Envy/Developer and enables application portability between ParcPlace-Digitalk and IBM Smalltalk. http://www.versant.com. Reader service #301.

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Designed to quickly create application code. Available for Windows 95, 3.1, and NT, and OS/2, Visual Smalltalk is the successor to ParcPlace-Digitalk's PARTS (Parts Assembly and Reuse Tool Set) system that allows programmers to create applications by pointing and clicking. Runs as native-product components that are binary-compatible across operating environments, so they can be used without modification when switching from one platform to another. $1495. http:/www.parcplace. com. Reader service #303.

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Visual/Recital Recital Corp., Danvers, MA 800-873-7443

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VisualAge C++ for OS/2 version 3.0 IBM Software Solutions, Somers, NY 520-574-4600; 800-426-3333

A C++ application development environment that combines visual programming with robust professional development tools. Developers can visually build applications from parts and combine the parts to construct programs. This product includes the IBM Open Class Library, a comprehensive set of building blocks; a complete code generation environment allowing programmers to develop and display applications across enterprises; and an extensive set of programmer tools: a C/C++ compiler, editor, **browser** , debugger, and performance trace analyzer. The 32-bit C/C++ compiler delivers solid code and the new 32-bit C++ linker is fast. Reader service #305.

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VisualGen version 2.0 IBM Software Solutions, Somers, NY 520-574-4600; 800-426-3333

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Watcom VX REXX Client/Server version 2.1 Sybase Inc., Emeryville, CA 519-886-3700 A visual development environment for creating OS/2 GUI applications. Includes connection, query, and chart objects that allow for accessing databases, manipulating data, and charting the results. Database connection and query objects simplify GUI client/server applications development. Visually designs and tests a SQL query, populates a window with objects that display data from the query, and provides search and update capabilities. Creates 3D charts with more than 150 display options and builds new databases with a database administrator. OS/2 client applications can connect to DB2/2 or DB2/6000. Access to DB2 for MVS (with IBM's DRDA support in OS/2). Watcom SQL and ODBC-enabled databases are supported. $299. Reader service #309.

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The visual programmer puts ActiveX document objects through their paces. (OLE Document Objects) (Technology Tutorial)(Tutorial)

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Abstract: Microsoft's OLE has been improved over several years and now includes in-place editing of embedded servers as well as ActiveX control and OLE control interfaces. OLE documents provide a way for applications to handle data in a storage-independent manner. ActiveX documents, also known as OLE Document Objects, make objects container-independent and enable them to run in any frame. The OLE Document **Object** specification was designed as a group of interfaces for use with the Microsoft Office Binder. The concept was extended and introduced as ActiveX Technologies for client applications in Dec 1995. Microsoft's **Internet** Explorer 3.0 will include ActiveX document support, as will the majority of Windows applications. Instructions for converting existing MFC-based OLE server applications into document **object** server applications are provided.

Text:

OLE has come a long way over the past few years, especially with regard to embedding technologies. At first, the best you could do was display an icon representing a server within a container and activate it separately by double-clicking on it. The next stage, a bit better, involved the static display of a server's contents within a rectangle. More recently, we've advanced to in-place editing of those embedded servers and to OLE control/ActiveX control interfaces.

ActiveX documents, also known as OLE Document Objects or doc objects, are the next logical step in this progression. If you're familiar with the MFC document/view design, you know that it specifies how programs create frames, views, and documents. Within the frame, the view window acts as a virtual display of the data contained in associated documents. Currently, an OLE 2 container/server interaction takes place in a rectangle granted to the server within the container's document. A doc **object** transaction takes place one level higher at the container application's frame level. A

doc **object** server takes over the entire client area of the container application, can adjust the frame's menus, and appears as if it is the application. To put it another way, OLE documents describe a method for programs to write out data in a storage-independent way. ActiveX documents, on the other hand, are mechanisms that make an **object** container-independent and able to run in any frame.

If you have Microsoft(R) Office for Windows(R) 95, you can see how this works right now. Doc objects were originally designed for use with the Office Binder application (see Figure 1), which lets you collect disparate Office-based documents. As you click on the document icon, Office Binder adjusts the entire view area on the right, including toolbars and menus. To the user, it looks like working in a single application, since the frame itself never changes or goes away.

The doc objects specification was first designed as a proprietary group of interfaces, used only in the context of the Microsoft Office Binder. (ISVs could sign up for the Office-compatible program, as outlined on the MSDN CD, to get specifications allowing them to Office-enable their own programs.) As the benefits of extending this concept became clear, the OLE doc objects specification was officially rolled out last December as part of Microsoft's ActiveX Technologies (formerly code-named Sweeper) client-side extensions. Microsoft **Internet** Explorer 3.0 will feature ActiveX document support, as will the Shell Explorer to ship with Nashville. ActiveX documents will soon permeate the entire Windows operating system line, so it's important that you become familiar with their workings and implementation. In the pages ahead I'll describe how to convert an existing MFC-based OLE server application into a doc **object** server, as well as how to provide doc **object** container support in your Visual Basic(R) 4.0 application. (My implementation of the MFC-based Document **Object** server is based on an early beta of MFC 4.2. MFC 4.2 should be available soon after this article appears in print.) Although Visual Basic 4.0 can't create ActiveX Document objects, Visual Basic 5.0, expected out at the end of this year, will provide this new feature (among other stuff too cool to mention here).

ActiveX Document OLE Interfaces

If you want your application to be an ActiveX document, able to work within an ActiveX doc **object** container, you must do four things:

* Implement IPersistStorage to use OLE compound files as a storage mechanism.

* Support basic OLE document-embedding features, such as the Create From File menu pick. This necessitates the interfaces IPersistFile, IOleObject, and IDataObject.

* Support in-place activation of OLE Documents through IOleInPlaceObject and IOleInPtaceActiveObject. This implies knowledge of a container's IOleInPlaceSite and IOleInPlaceFrame interfaces.

* Support the ActiveX document extensions through four new server-side interfaces: IOleDocument, IOleDocumentView, IOleCommandTarget, and IPrint.

That slightly glazed-over look in your eyes can only mean one thing--you thought you were going to be able to avoid OLE for just a bit longer. A chart or two might make these specifications slightly less daunting. Figure 2 shows a slightly more readable form of the information in the list above, including the newly defined ActiveX document interfaces. If you look at this chart and feel like you're drowning in interfaces, don't worry. In the land of MFC, you don't have to implement everything by hand.

As OLE has evolved, the document/view system used in a standard MFC application has been seamlessly integrated with coordinating OLE interfaces. This is all done quietly within the base class definitions, so you never even know about it unless you browse through the header files. If you compare the basic output of MFC 1.0's AppWizard and today's version, the program might look about the same. However, it will support a broad array of OLE embedding functions, all of which you get for free.

Not only do you get stuff without asking for it, you may also discover that your application already has a dreaded **interface** implemented, buried somewhere in the depths of the MFC base classes. This makes it clear why

you should install MFC source code along with the Microsoft Developer's Studio, even though it takes up some more disk space.

Take a closer look at Figure 2. On the left, you'll see what you have to implement to become an ActiveX document container. We don't need to know about any of that right now, since we're concentrating on writing embeddable applications, not frames. You'll get all the stuff on the left when you open up **Internet** Explorer 3.0 or Microsoft Office Binder (or the Visual Basic sample later in this article). It's the stuff on the right, the server specification, that interests us.

Let's concentrate on everyone's favorite sample, the MFC Scribble application. When you implement a standard document/view MFC application like Scribble, your document class gets an appropriate name like CScribbleDoe. This class is derived from COleServerDoc, which is several layers away from the simple base class CDocument. As it turns out, these layers contain a lot of OLE functionality. Most of the interfaces you need to implement an ActiveX document server are already encapsulated within your CScribbleDoc (see Figure 3). In fact, without touching a line of code, six of the ten server-side interfaces already exist--you only have to implement the four new ones (IOleDocument, IOleDocumentView, IPrtnt, and IOleCommandTarget).

Obviously, each of these four remaining interfaces is important for an ActiveX document server's health. Before we look at how you can add these interfaces to an existing project, we need to investigate just what they do. These four interfaces are all defined in DOCOBJ.H; a simplified version (based on the DOCOBJ.IDL **interface** definition language file) is shown in Figure 4.

IOleDocument

By implementing the IO1eDocument **interface** , an **object** indicates that it can act as an ActiveX document. An ActiveX document container uses a server's IOleDocument to create new server views, enumerate these views, and retrieve MiscStatus bits relevant to the ActiveX document. (What we call a view is really an IOleDocumentView, an **interface** I'll discuss shortly.) IOleDocument implementations therefore need three functions: CreateView, EnumViews, and GetDocMiscStatus. CreateView creates and allows (optional) initialization of a new view. GetDocMiscStatus returns the value of the **object** 's MiscStatus bits. These are also saved in the doc objects registry key of this **object** . EnumViews returns an enumeration of the document's views, or a pointer to its single view. IEnumOleDocumentViews, the returned enumeration, is a standard enumerator **interface** typed for IOleDocumentView. (An enumerator **interface** is defined with the operators Next, Skip, Reset, and Clone, and allows its user to walk through a list of document view objects.)

IOleDocumentView

The IOleDocumentView **interface** refers to a single instance of an ActiveX document view, a concept closely related to an MFC view. The **interface** provides everything needed for a container to perform site management--sizing, activating, and resetting an ActiveX document's bounding area. To do this, IOleDocumentView implements in-place site functions, as well as others like GetRect, Show, UIActivate, and Clone (see Figure 5). When implemented within an MFC-based document/view application, information sent to the IOleDocumentView **interface** by the host will be reflected back to the MFC view class, allowing it to adjust itself accurately. For example, IOleDocumentView is notified when you resize the container.

IOleCommandTarget

IOleCommandTarget is an optional **interface** that lets ActiveX document container and servers send each other commands, without resorting to tricks such as assigning fixed menu IDs. Instead, this mechanism lets a caller query it to find out which commands it supports (from a standard enumerated list) as well as letting an **object** execute all supported commands. Two functions are provided: QueryStatus returns an **object** 's support for a particular command; Exec asks an **object** to execute a supported command, indicated by ID.

A caller passes in a list of OLECMD structures, each of which contains

a command ID and a place to put informational flags on return. The implementor fills in each structure with one or more OR'd flags from the list shown in Figure 6. An OLECMDTEXT list works the same way, receiving a localized name and status string for each command requested. This allows a hosting program to change its status bar when a command is invoked.

Using the Exec function, you can call a specific command by ID (for instance, OLECMDID_OPEN is equivalent to File Open), and provide incoming and outgoing arguments (although these are usually NULL). There are several options defined within the OLECMDEXECOPT enumeration that indicate how the **object** should execute this command (see Figure 7).

A number of common commands have already been defined in the IOleCommandTarget **interface** for use with the Exec function. These mostly deal with the File and Edit menus (see Figure 8).

IPrint

Like IOleCommandTarget, IPrint is an optional addition that lets an **object** support programmatic printing. The three functions provided by IPrint tell the server **object** to print (Print), retrieve print-related information (GetPageInfo), and set the initial page number of a print job (SetInitialPageNum). When the IPrint::Print function is called, it takes as input any of a group of flags indicating what defaults are set for the print job (see Figure 9).

Adding ActiveX Document OLE Interfaces To An MFC Project

Microsoft beat me to the punch by including a sample called BINDSCRB in Visual C++(R) 4.1. This sample includes the implementation of the ActiveX document extensions, and shows how to write a program that uses them. Visual C++ 4.2, slated for release shortly after this article goes to press, will "naturalize" this process, migrating these **interface** definitions and their class wrappers to standard MFC, making it far easier to design a full-blown ActiveX document server.

The BINDSCRB sample includes nine CPP implementation files: BINDDCMT.CPP, BINDDOC.CPP, BINDIPFW.CPP, BINDITEM.CPP, BINDTARG.CPP, BINDVIEW.CPP, MFCBIND.CPP, OLEOBJCT.CPP, and PRINT.CPP. Additionally, four header files are used the implement ActiveX documents: BINDDOC.H, BINDIPFW.H, BINDITEM.H, and MFCBIND.H. (These names may change before the final release of Visual C++ 4.2.) To make it easier to use these files, they are all wrapped up in AFXBIND.H, which can be inserted into an STDAFX.H file.

These files introduce three new classes to MFC: CDocObjectIPFrameWnd (COleIPFrameWnd with ActiveX document extensions), CDocObjectServerDoc (based on COleServerDoc), and CDocObjectServerItem (from COleServerItem). In each case, these classes extend the main classes used to build MFC documents.

Look at the files in the Scribble application (as defined as a Visual C++ 4.0 sample). Three major classes--CInPlaceFrame, CScribbleDoc, and CScribbleItem--are defined as follows:

```
class CInPlaceFrame: public COleIPFrameWnd
class CScribbleDoc: public COleServerDoc
class CScribbleItem: public COleServerItem
```

Since the new CDocObjectXxx classes are derived from the Scribble base classes directly, they can be popped in the Scribble class definitions as replacements. Turn Scribble into an ActiveX document server by changing the lines above to look like these:

```
class CInPlaceFrame : public CDocObjectIPFrameWnd
                                    //(see file IPFRAME.H)
class CScribbleDoc: public CDocObjectServerDoc
                                    //(see file SCRIBDOC.H)
class CScribbleItem: public CDocObjectServerItem
                                    //(see file SCRIBITM.H)
```

This will soon be an option within the Visual C++ AppWizard, but it's a by-hand process right now. Also, your program must be tagged in the registry as supporting the ActiveX documents specification. MFC already takes care of registration settings every time a program executes, so this isn't a huge burden. In the CScribbleApp::InitInstance routine, adding one call to a predefined function takes care of this for you.

```
MfcBinderUpdateRegistry(
```

```
          pDocTemplate,
          OAT_INPLACE_SERVER);
```
The MFC base class overrides handle the details of the ActiveX implementation. The source code for updated portions of Scribble is shown in Figure 10.

Getting There In Visual Basic

As I've mentioned before, ActiveX documents are a feature of Microsoft **Internet** Explorer 3.0, and will be supported in the Shell Explorer in future versions of Microsoft Windows. You can't directly automate **Internet** Explorer from Visual Basic, but you can get to the important part: the **browser** window. The ActiveX SDK (currently available at http://www.microsoft.com/intdev/sdk/) contains a file called SHDOCVW.DLL, which is really an OLE control. Installing the ActiveX SDK automatically registers this file. It shows up in the Visual Basic 4.0 (32-bit version) **custom** control list as "Microsoft **Internet** and Shell Controls."

This DLL provides two controls visible in the Visual Basic **toolbar** : ShellExplorer and ShItemOC (shell item). The ShellExplorer control interests us most because it's an OLE control wrapper around the **browser** window included in **Internet** Explorer 3.0. Unlike the HTML control in the **Internet** Control Pack (which interprets HTML input and shows it in a screen), this is an actual COM wrapper around **Internet** Explorer 3.0. It exposes all the functionality of that product, from Visual Basic Script to ActiveX documents. If the hosting program has a menu, this control also performs proper negotiation. When you're looking at a Web site, you'll get the **Internet** Explorer 3.0 menu, allowing you to view a site's source--or refresh it--without any work on your part.

I'm mentioning this control because it gives you all you need to write a Visual Basic program that's also an ActiveX document container. This is logical because **Internet** Explorer 3.0 is an ActiveX document container and you're getting all its functionality. The simplest way to get this working is to open a new project in Visual Basic 4.0 (this is 32-bit only) and add the "Microsoft **Internet** and Shell controls" choice from the Tools/**Custom** Controls menu (or by right-clicking the toolbox). Two new control icons appear. Add a ShellExplorer to your project's form (make it as big as possible), then add three buttons and a text box to the form. Finally, add a menu with anything on it--a simple File/Exit will suffice. Now that you have a form set up, you only have to enter three lines of code to create a simple, yet highly functional, Web **browser** and ActiveX document shell.

```
     Private Sub Command1_Click()
         ShellExplorer1.Location = Text1.Text
     End Sub
     Private Sub Command2_Click()
         ShellExplorer1.Application.GoBack
     End Sub
     Private Sub Command3_Click()
         Shell Explorer1.Application.GoForward
     End Sub
```

The first button sets the **browser** window's location to the string in the text box. The second and third are the Back/Forward controls you'd have in a full-blown **browser** . When the program first runs, the ShellExplorer displays the contents of your system, similar to the My Computer icon in Windows 95. When you enter a new Web address in the text box and click the first button, the site displays automatically, including any necessary dial-ups (see Figure 11). Clicking on an HTML hyperlink loads the new page without any intervention on your part.

You can also get to a file by clicking on it in the My Computer screen. However, in my beta release of **Internet** Explorer 3.0, this method loads the file into the associated program in a separate window, even if the program is an ActiveX document server. If you type a filename into the textbox and click the first button, the file ShellExplorer control Loads the file as a working ActiveX document. Try it with a Microsoft Word or Microsoft Excel file, or even better, check out a file saved with the modified Scribble application--such as MSJSCRIB.OSC (see Figure 12).

Wrapup

ActiveX documents began life as Office Compatible objects, and this holds true today. To be hosted in the Microsoft Office Binder, an application must support the ActiveX document interfaces and OLE structured storage. But what started as a proprietary **interface** , unavailable to most users, has become an emerging standard in advanced OLE technology.

ActiveX document interfaces will be the basis of future Windows shells, starting with the Shell Explorer in Nashville. You can start to develop and test both documents and viewers with tools available today--Microsoft Visual C++ 4.0, Visual Basic 4.0, and the free ActiveX SDK. By making a few very simple changes in existing MFC-based projects, you can dramatically extend your OLE functionality, and by writing a short program in Visual Basic, you can get a jump on the next release of the Windows shell.

Joshua Trupin is a software developer specializing in C/C++ and Visual Basic apps for Windows. He can be reached at 75120.657@compuserve.com or geeknet@ix.netcom.com.

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